Canopy was developed and is distributed by Natural Path Forestry Consultants (NPFC) based in Missoula, Montana. NPFC are currently updating their software to Windows® which will be available in 1999. There are over 70 communities using Canopy nationally and internationally.

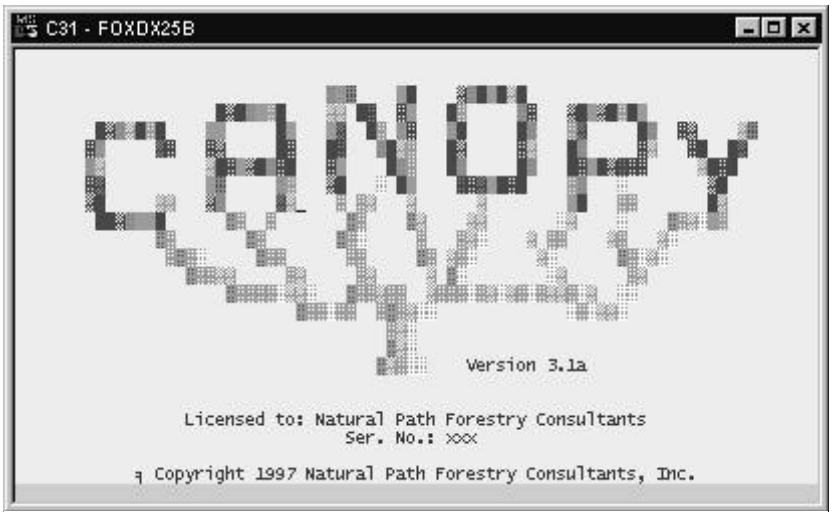
Services

- Urban forestry management plans
- Tree risk-management polices
- Natural area restoration
- Expert witness
- Tree preservation ordinances
- Urban forestry program audits
- Tree inventories
- GIS mapping
- Urban forestry training workshops

System requirements

- MS-DOS® 5.0 or later (Windows® 95, 98, NT® recommended)
- 386 processor (Pentium® recommended)
- 8 MB of RAM (16 recommended)
- 5 MB of hard disk space, and 600 bytes per tree site
- Keyboard (keyboard and mouse recommended)

Canopy was primarily used on a Gateway™ G6-200 Pentium® Pro using Windows NT®. Canopy was also used with Windows® 95 and 98, on a Gateway™ P5-166 Pentium® and a G6-300 Pentium® II, respectively. The Canopy directory uses 5,411 KB of hard disk space. After entering data for 454 tree sites the directory size increased to 5,587 KB. Therefore 1,000 tree sites would require approximately 388 KB (0.38 MB).



▲ *Figure 3.1.1: Canopy splash screen.*

Software cost

Canopy is purchased from Natural Path Forestry Consultants at a base price of $2,600.00. Contact NPFC for further details. A demonstration version is available.

Technical support

NPFC provides three days of on-site training and one free year of technical support with the purchase of their software. An optional $475.00 annual fee provides unlimited support and upgrades. Online documentation is provided.

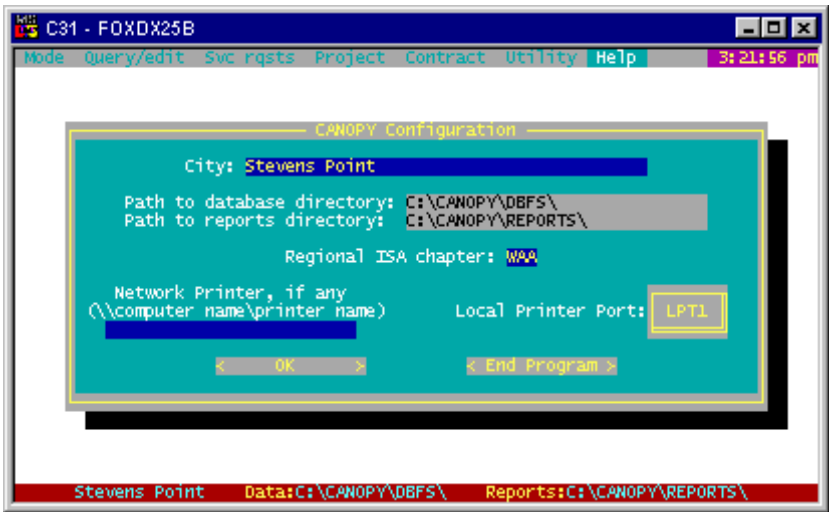
Contact

Natural Path Forestry Consultants
P.O. Box 7723
Missoula, MT 59802

Phone: (406) 721-3263
Fax: (406) 543-2295
Email: natpath@naturalpath.com
Internet: www.naturalpath.com

The **bold** text in the following description refers to either screen or list screen names. *Italicized* text refers to either field names or field list selections.

The **canopy configuration** screen allows for specifying a *city*, *regional ISA chapter*, *printer*, and the *database* and *reports directory* paths (Figure 3.1.2). A *regional ISA chapter* is selected from a pick list, which is linked to a database used for calculating tree values (CTLA valuation). A *LPT*, *COM*, or *network printer* can be specified in this screen.



▲ *Figure 3.1.2: The city name, directory paths, regional ISA chapter, and printer are specified in the canopy configuration screen.*

Customizable databases include *addresses*, *streets*, *land-use categories*, *utility situations*, *parkway configurations*, *species*, *defects*, *maintenance actions*, *removal reasons*, *vendors*, *planting types*, *appraisal parameters*, and *zone/section combinations*. Records for these databases are added, edited, deleted, and printed through the screens described below. Records in these databases referenced by other databases can not be deleted.

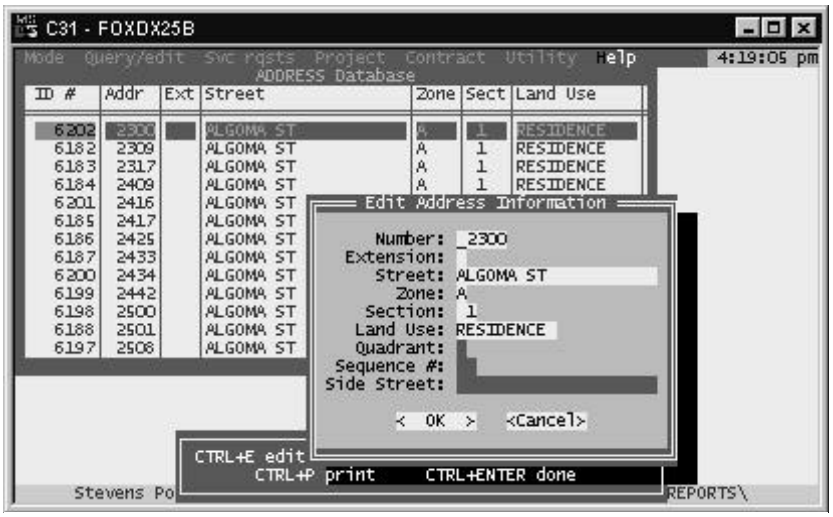
Defining streets

Streets are added and edited through the **edit street record** screen (Figure 3.1.3). A *street* name up to 20 characters and an abbreviation up to ten characters must be entered.

▲ *Figure 3.1.3: A street name and abbreviation are entered when defining streets.*

Defining addresses

The **edit address information** screen is used to edit and add addresses (Figure 3.1.4). An address *number* up to five characters, *street* name, *zone/section* combination, and *land use* are entered. *Street* name, *zone/section* combination, and *land use* can be selected from pick lists. Sections are sub-units within zones. Data can also be entered into these fields during data entry. *Quadrant*,

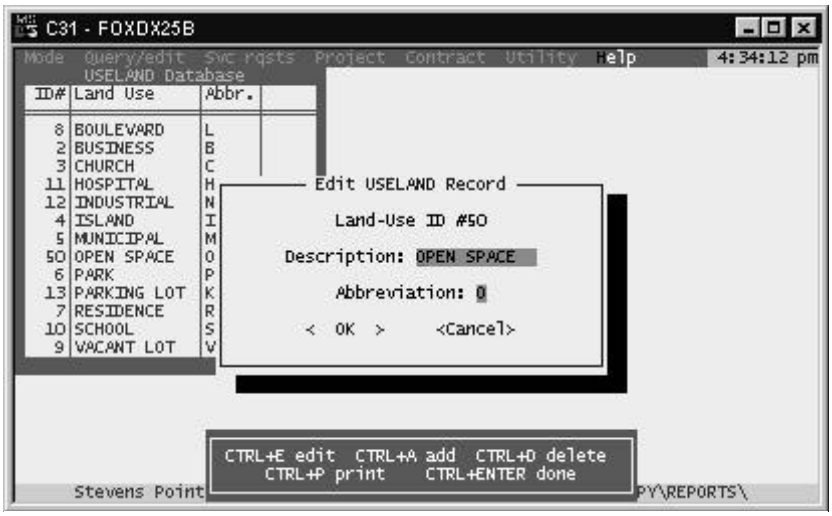


▲ *Figure 3.1.4: Address information including number, street, zone, section, and land use can either be entered during or prior to data entry.*

sequence number, and *side street* data can only be entered during data entry.

Defining land use

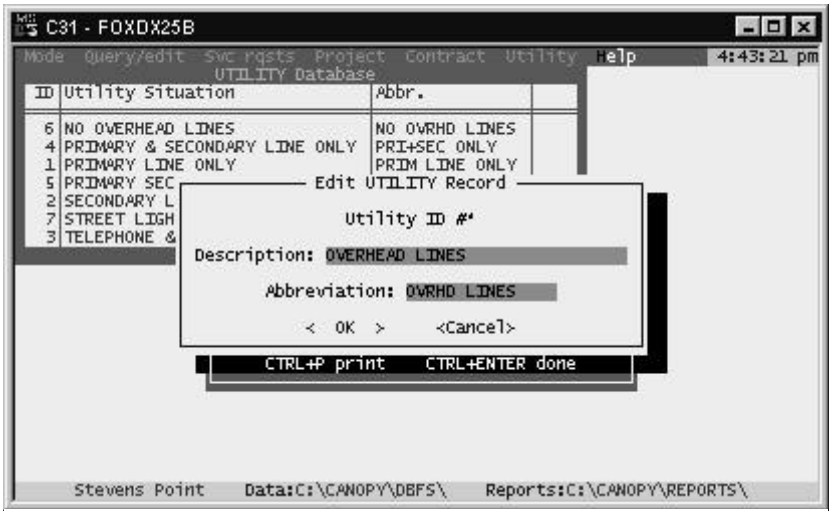
Land use categories are added and edited through the **edit useland record** screen (Figure 3.1.5). A land use description up to 12 characters and a one character abbreviation must be entered. Land use categories included with the program can not be edited or deleted.



▲ *Figure 3.1.5: Land use descriptions and abbreviations can be added to the existing land use database.*

Defining utilities

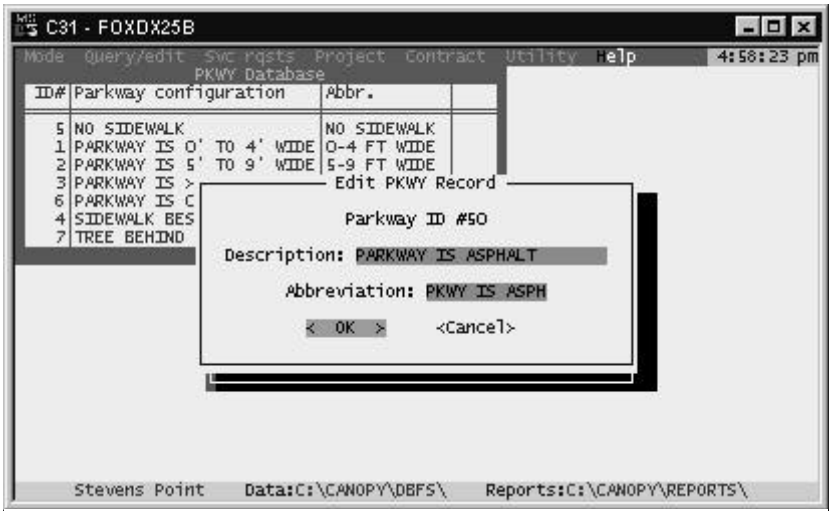
The utility database contains utility situation descriptions encountered at tree sites. Up to a 30 character description and up to a 15 character abbreviation for the utility situation must be entered in the **edit utility record** screen (Figure 3.1.6). Utility situations included with the program can not be edited or deleted.



▲ *Figure 3.1.6: Utility situations encountered at tree sites are defined in the edit utility record screen.*

Defining parkways

Parkway configurations are added and edited through the **edit pkwy record** screen (Figure 3.1.7). Up to a 25 character parkway description and up to a 12 character abbreviation must be entered. Parkway configurations included with the program can not be edited or deleted.



▲ *Figure 3.1.7: Additional parkway configurations can be defined in the existing parkway database.*

Defining species

The **enter new species information** screen is used to add and edit tree species information (Figure 3.1.8). A *species type* must be entered as either *C* (conifer), *D* (deciduous), or *S* (shrub). A *common name*, *abbreviation*, *latin name*, *genus*, *family*, and *species rating* (CTLA valuation) must also be entered. *Common name* can be up to 35 characters, *abbreviation* up to 17 characters, *latin name* up to 30 characters, and *genus* and *family* up

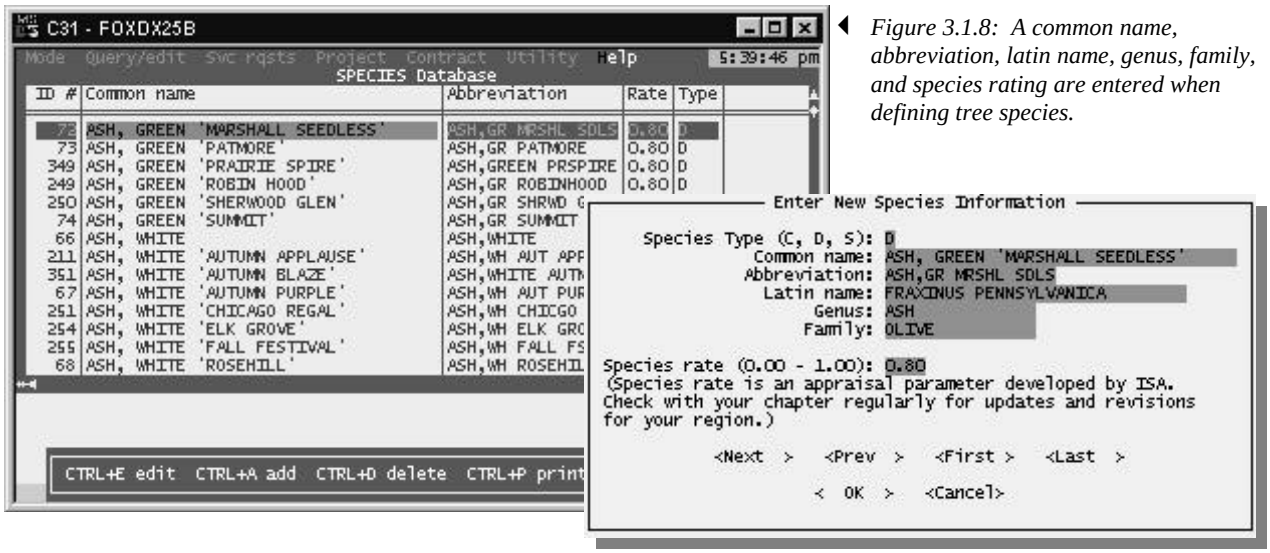


Figure 3.1.8: A common name, abbreviation, latin name, genus, family, and species rating are entered when defining tree species.

to 15 characters. This screen allows for scrolling forward and backward through the species list, and for moving to the first and last record. Species included with the program can not be deleted.

Defining defects

Tree defects are added and edited through the **edit defect record** screen (Figure 3.1.9). A defect type of *I* (insect), *D* (disease), or *P* (physical) must be entered, along with up to a 25 character defect description and an up to a 12 character abbreviation. Defects included with the program can not be edited or deleted.

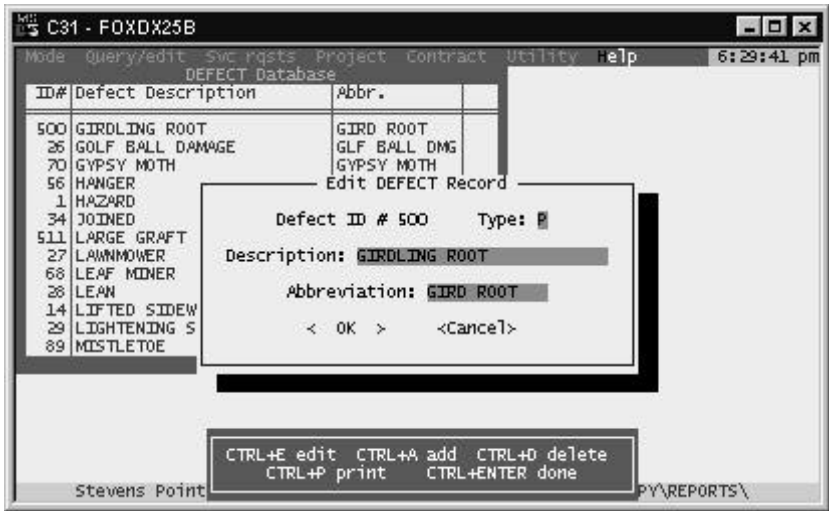


Figure 3.1.9: Tree defects include insect, disease, and physical problems. A list of defects is provided with the program.

Defining maintenance actions

Maintenance actions are added and edited through the **edit action record** screen (Figure 3.1.10). An action description up to 20 characters and an abbreviation up to seven characters must be entered. Maintenance actions included with the program can not be edited or deleted.

Figure 3.1.10: Tree maintenance actions can be added to the existing action database.

Defining removal reasons

A database is provided for tree removal reasons. A description up to 25 characters and an abbreviation up to ten characters must be entered

when additional removal reasons are defined (Figure 3.1.11). Removal reasons included with the program can not be edited or deleted.

Defining vendors

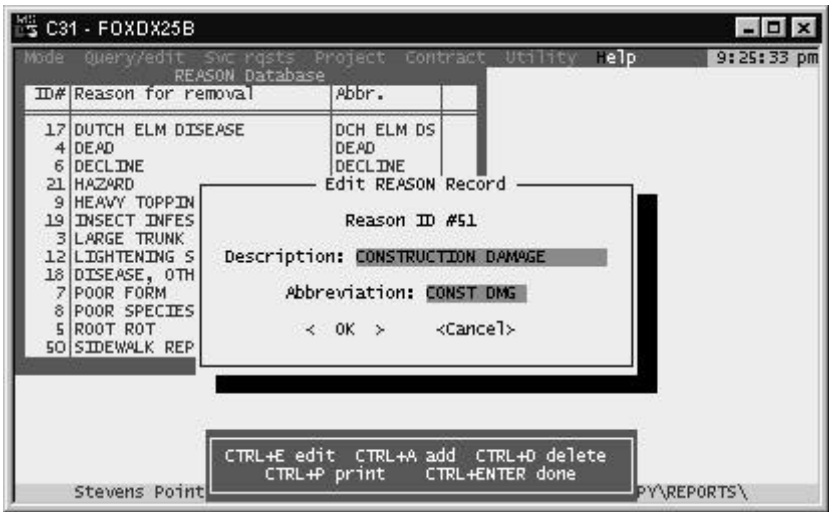
Vendors refer to tree care companies that provide contractual services. A vendor name up to 30 characters must be entered in the **vendor information** screen (Figure 3.1.12). The remaining fields are optional. A vendor *type* is chosen from a pick list that contains *arborist*, *landscaper*, *consultant*, *nursery*, and *other* selections. Additional vendor *types* can be defined when *other* is selected. The first and last name of the *contact* person can be up to ten and 15 characters, respectively. A *phone* number up to 12 characters, *address* up to 25 characters, *city* name up to 15 characters, *state* abbreviation, *zip* code, and *notes* may also be entered.

Defining planting types

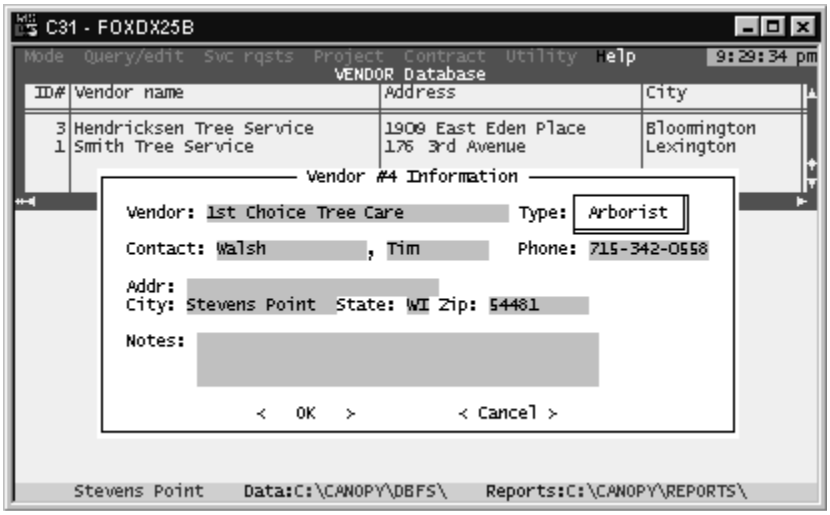
The planting type database stores descriptions for sources of funding for plantings. A *description* up to 20 characters and an *abbreviation* up to one character must be entered in the **edit typeplt record** screen (Figure 3.1.13). Planting types included with the program can not be edited or deleted.

Defining appraisal information

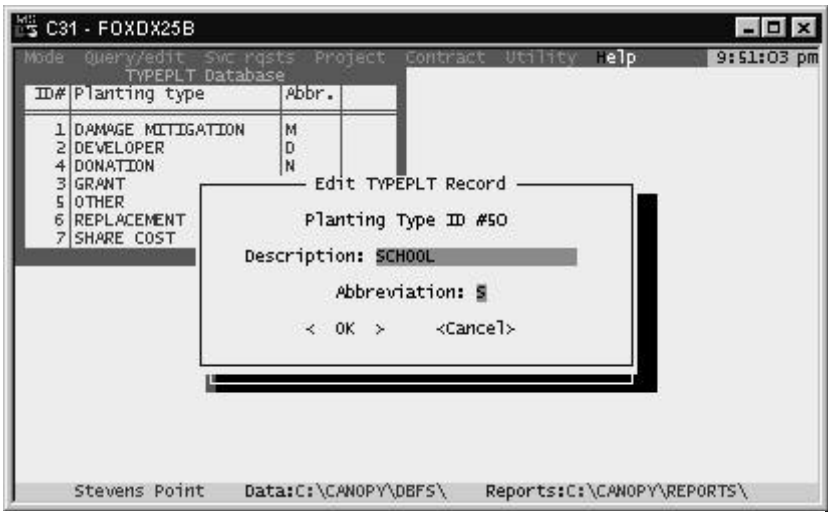
Tree appraisal information is added and edited through the **edit apprais record** screen (Figure 3.1.14). Entering data into all fields in this screen is required. An *ISA Chapter* abbreviation, *default location* percentage *rating*, *maximum transplantable diameter*, *replacement cost*, and *basic price* for both *deciduous* and *coniferous* trees are entered. The *ISA chapter*



▲ *Figure 3.1.11: A description and an abbreviation are entered when adding tree removal reasons to the existing database.*



▲ *Figure 3.1.12: Information for contractual tree care companies is entered in the vendor information screen.*



▲ *Figure 3.1.13: Funding sources for plantings can be added to the existing database.*

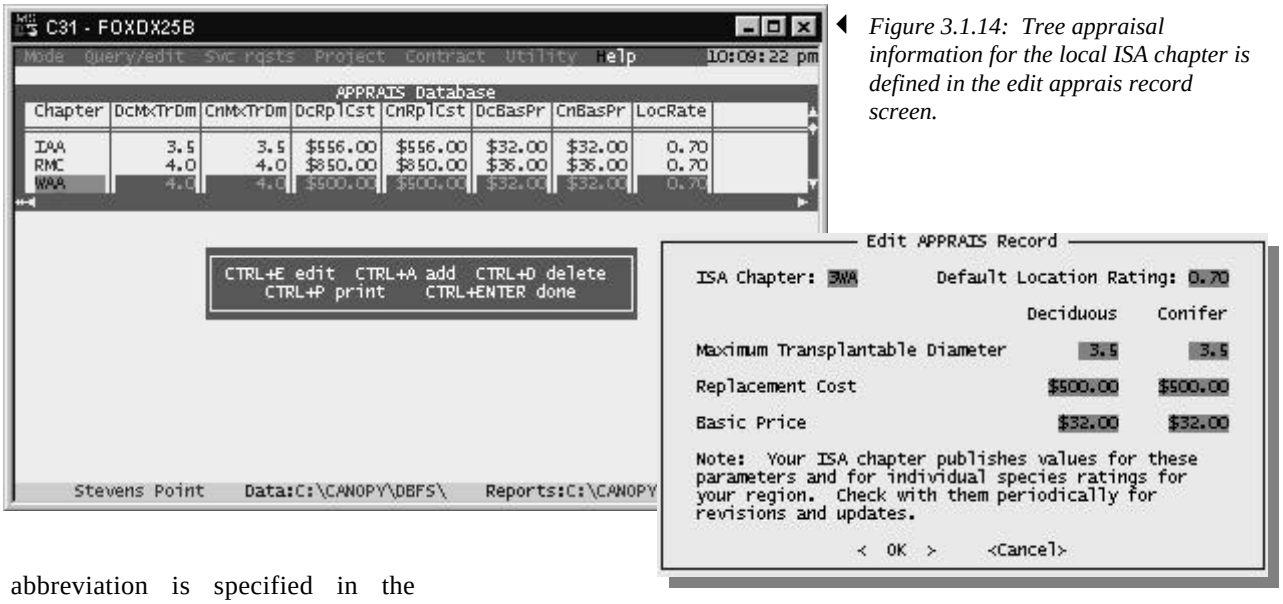


Figure 3.1.14: Tree appraisal information for the local ISA chapter is defined in the edit apprais record screen.

abbreviation is specified in the **canopy configuration** screen (Figure 3.1.2).

Defining zones and sections

The **edit zonesect record** screen is used to add and edit *zone* and *section* combinations (Figure 3.1.15). *Sections* are treated as sub-units of *zones*. A one character *zone* identifier and up to a two character *section* identifier must be entered.

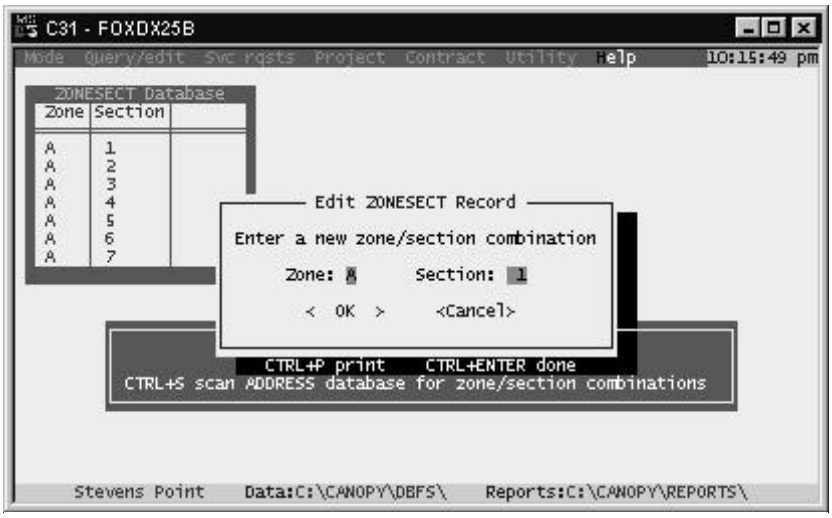


Figure 3.1.15: Zones and their corresponding sections are defined in the edit zonesect record screen.

Adding tree sites

A dialog appears listing necessary tree site information when a new tree, removal, or planting site is added (Figure 3.1.16). A *tree*, *planting space*, or *removal* must then be specified. In the **new address information** screen the house *number*, *extension*, and *street* are entered (Figure 3.1.17). A *street* pick list is available. *Zone*, *section*, and *land use* information are only entered if the address is new. After entering data into these fields a dialog appears asking to enter the tree site *quadrant*, which can be either *F* (front), *R* (right), *L* (left), or *B* (back) (Figure 3.1.18). A *side street* is entered if the quadrant is in the right, left, or back quadrants. A site *sequence number* is entered if there are other trees present in the selected quadrant.

Parkway and *utility* information are entered in the *site description* box of the **data entry** screen (Figure 3.1.19). Pick lists are available for each of these fields. Entering data into these fields is required.

Information for *species*, *diameter*, *spread*, *height*, and number of *stems* is entered in the *tree description* box of the **data entry** screen. Entering data into *species* and *diameter* fields is required, and a pick list is available for *species*. Tree *diameter* can be entered to one decimal place. *Spread* can be up to three characters, and *height* and *stems* can each be up to

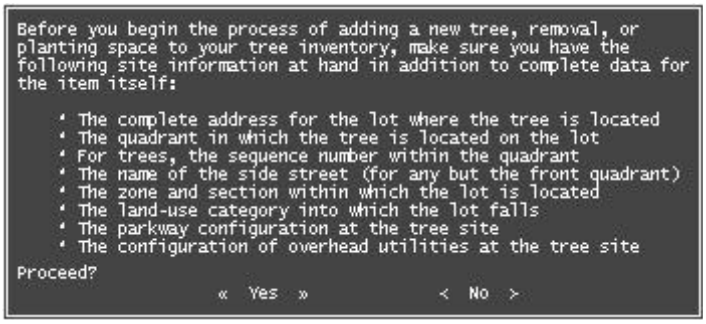


Figure 3.1.16: A dialog listing needed inventory information must be confirmed before adding tree sites.

Figure 3.1.17: Address number and street name are entered first when adding tree sites.

Figure 3.1.18: A quadrant of either front, left, right, or back is specified after entering address information. A side street is specified for left, right, and back quadrants.

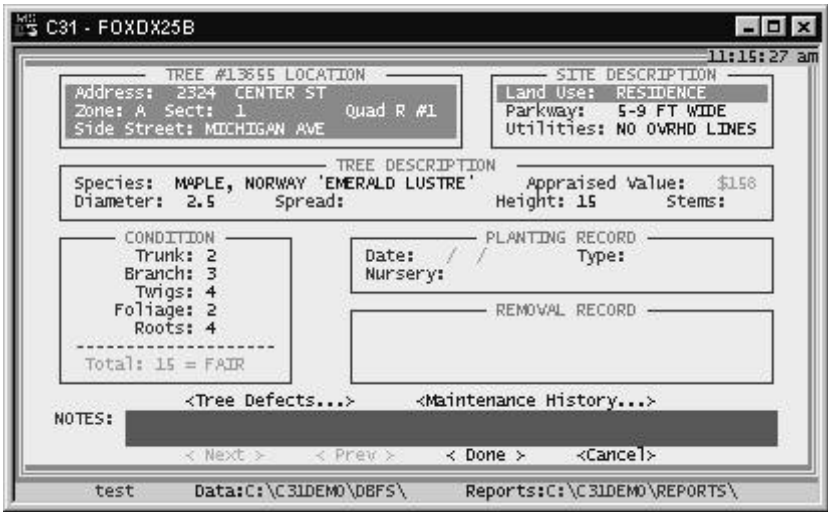


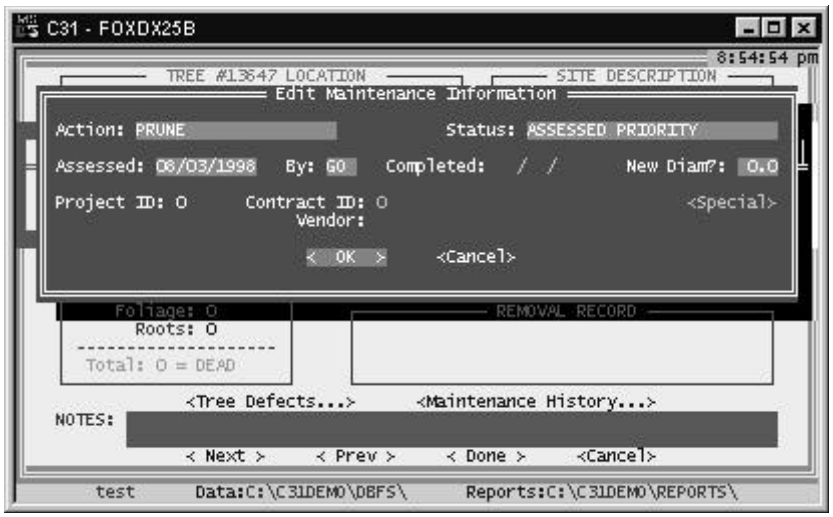
Figure 3.1.19: Site description, tree description, condition, tree defect, and maintenance history data are entered through the data entry screen.

two characters. *Appraised value* is calculated automatically.

Condition ratings from zero to five (poor to excellent) for the *trunk*, *branches*, *twigs*, *foliage*, and *roots* are entered in the *condition* box. Entering values into each of these fields is required. The total is calculated automatically and a descriptive term of either *dead*, *very poor*, *poor*, *fair*, *good*, or *excellent* is assigned.

Tree defects and *maintenance history* are also entered through the **data entry** screen. *Tree defects* are added to the **tree defects** screen from a pick list (Figure 3.1.20). *Maintenance history* information is added and updated in the **edit maintenance information** screen (Figure 3.1.21). Entering a maintenance *action* is required, and can be either typed or selected from a pick list. The *action* field can not be modified when updating maintenance history information. Other fields include *status*, *assessed*, *by*, *completed*, and *new diameter*. Maintenance *status* can be either typed or selected from a pick list, which contains *assessed priority*, *assessed regular*, *completed*, *confirm*, *scheduled no prior assessment*, *scheduled priority*, and *scheduled regular* selections. *Scheduled* options can not be selected since maintenance actions are not scheduled in this screen. These options are reserved for predefined work projects described later in this section. The *assessed* field represents the date that the maintenance action was assessed, and the *completed* field represents the date that the maintenance action was completed. The initials of the inspector can be entered, and a *new diameter* can be entered if the tree has a larger diameter at the time of maintenance assessment or completion. *Project* and *contract ID* information is displayed automatically if a project or contract were previously assigned to the maintenance action. A *vendor* field automatically displays the name of the contractor based on the contract number when applicable.

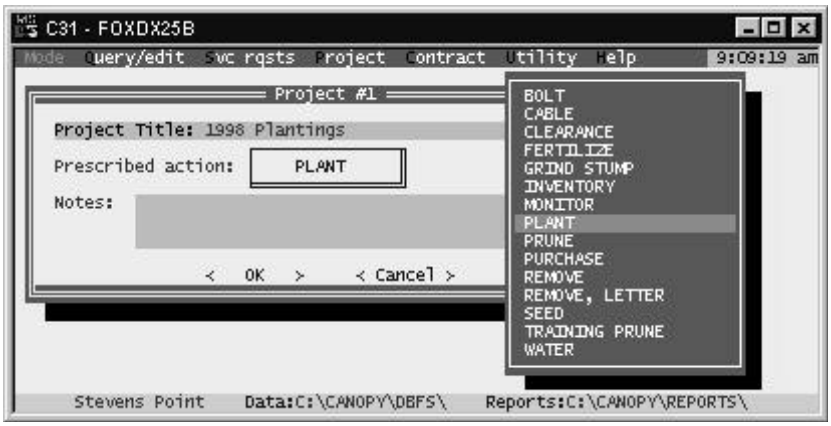
▲ *Figure 3.1.20: Tree defects are added to the tree defects screen from a pick list.*



▲ *Figure 3.1.21: Maintenance history information is added and updated in the edit maintenance information screen.*

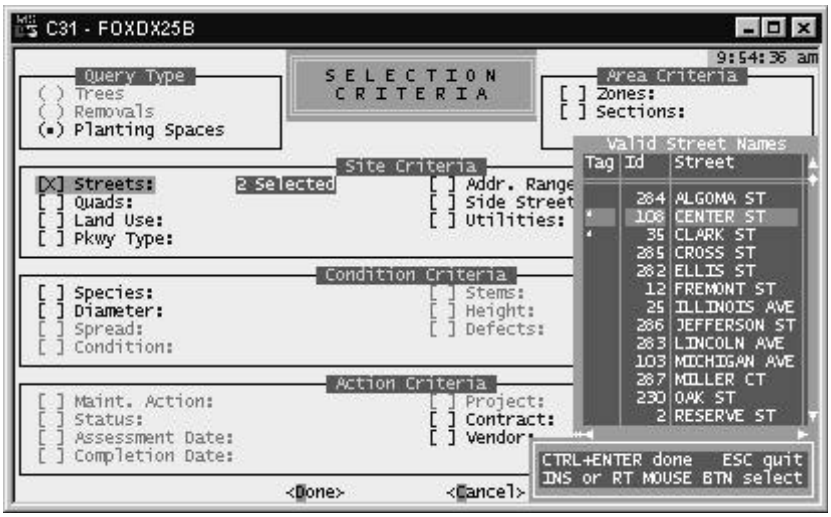
Creating projects

When creating a project a *project title* up to 30 characters must be entered in the **project** screen (Figure 3.1.22). A prescribed *action* must also be entered and can be selected from a pick list. Entering *notes* about the project is optional. Figure 3.1.22 indicates a project created for 1998 plantings. Canopy automatically creates a companion purchase project when planting projects are created.



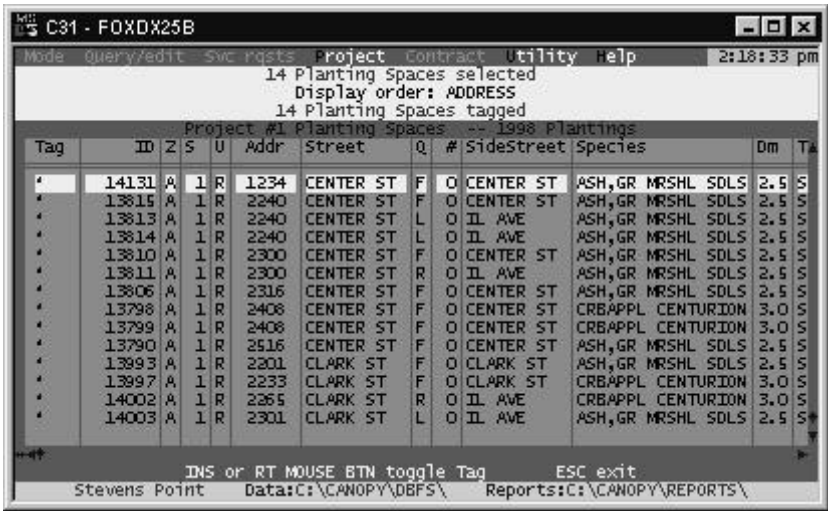
▲ *Figure 3.1.22: Projects can be created for maintenance actions such as plantings, removals, cabling, watering, stump grinding, pruning, and inventorying.*

Tree sites are added to projects by selecting either global tree attributes or specific trees at an address. The **selection criteria** screen is used when selecting global tree attributes (Figure 3.1.23). A combination of *area*, *site*, *condition*, and *action criteria* can be specified for the desired tree sites. Selectable *site criteria* include *streets*, *quadrants*, *land use*, *parkway type*, *address range*, *side street*, and *utilities*. *Condition criteria* include *species*, *diameter*, *spread*, *condition*, *stems*, *height*, and *defects*. *Action criteria* include *maintenance actions*, *status*, *assessment date*, *completion date*, *contract*, and *vendor*. Pick lists are available for these criteria. Figure 3.1.23 indicates all planting spaces selected on two streets.



▲ *Figure 3.1.23: The selection criteria screen queries the database based on selected area, site, condition, and action criteria.*

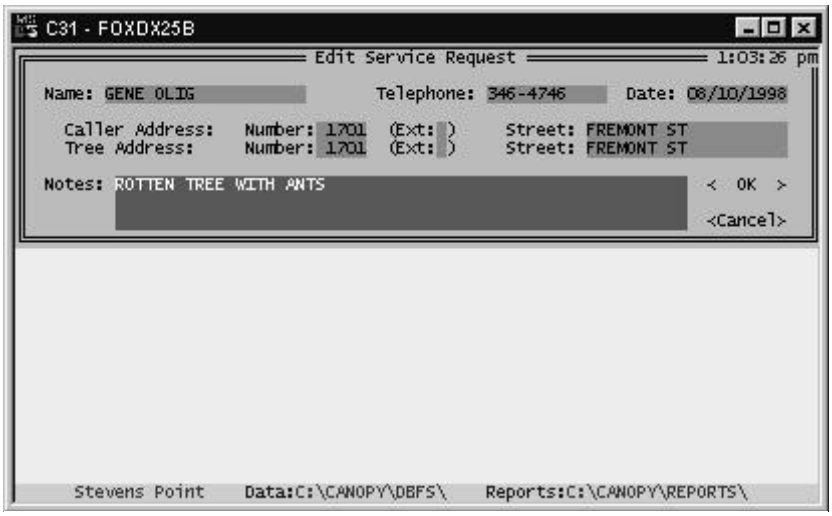
The **project tree list** screen is used to view, print, add, edit, and delete tree sites in the project (Figure 3.1.24). Planting sites can be created from this screen using a simplified data entry form that can be printed for field use. Project tree sites can be added to an existing or new contract, costs can be forecasted, bid forms can be generated, and field verification forms can be printed through this screen.



▲ *Figure 3.1.24: Project tree sites are added, printed, edited, and deleted through the project tree list screen. Cost forecasts, bid forms, and field verification forms can be created.*

Adding service requests

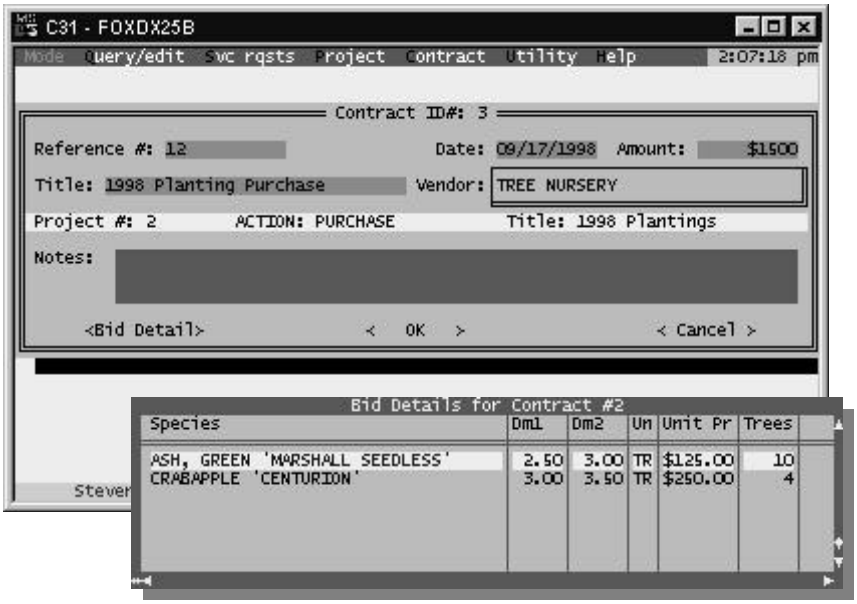
The **edit service request** screen is used to log service request information (Figure 3.1.25). A caller *name*, *telephone* number, and request *date* must be entered. The *caller* and *tree* address *number* and *street* must also be entered. A pick list is available for *street* fields. Once caller address information is entered the same information is automatically assigned to the tree address fields, although these can be edited. Notes can be entered for the service request.



▲ *Figure 3.1.25: Service request information includes caller name, telephone number, date, and address information.*

Adding contracts

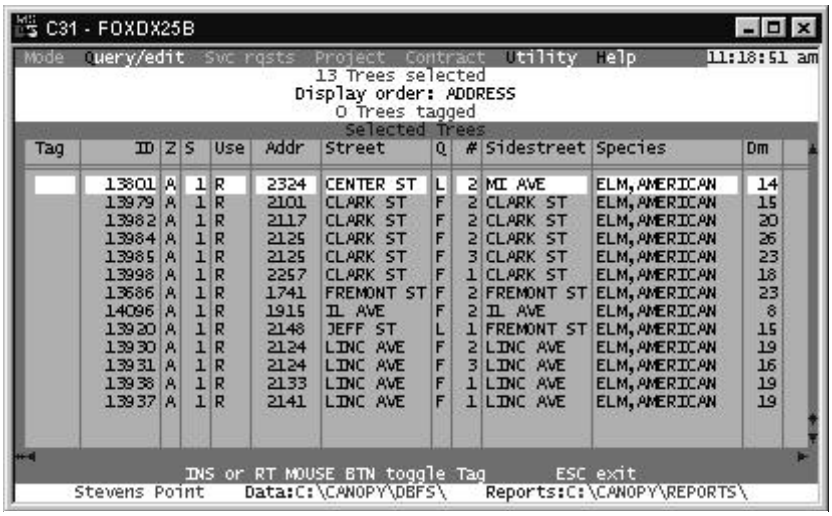
Information about contracts and bids can be entered into Canopy. A project associated with the contract can be specified before entering contract information. Contract information is entered in the **contract** screen where a *reference number*, *date*, *amount*, *title*, and *vendor* must be entered (Figure 3.1.26). Project information including *project number*, *action*, and *title* is automatically listed when a project is associated with the contract. Bid details are entered if the contract is to be used to forecast costs. A *species*, bid *unit* basis, and *unit price* must be entered. The bid *unit* is based on either the total number of trees (*TR*) or the total diameter (*DM*) of trees in the bid category. Lower (*Dm1*) and upper (*Dm2*) limit diameters along with the number of *trees* can also be entered for the bid category. Trees are added to a contract from the **project tree list** screen after the contract is created (Figure 3.1.24).



▲ *Figure 3.1.26: Contract information including date, amount, title, and vendor can be entered. Bid details are entered to forecast costs.*

Queries

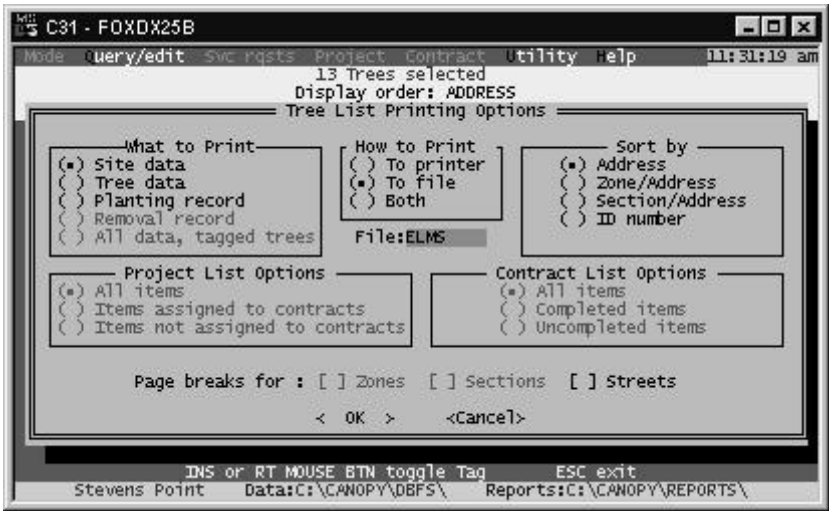
The **selection criteria** screen is used to perform queries on databases (Figure 3.1.23). A query is performed by selecting a *query type* of either *trees*, *removals*, or *planting spaces*. A combination of *area*, *site*, *condition*, and *action criteria* are selected to filter the query as previously described. The example in the **selected trees** screen indicates all American Elms (*Ulmus americana*) with *condition* values of *fair*, *poor*, *very poor*, or *dead* (Figure 3.1.27). The tree list can be printed or saved to a text file with information that is sorted either by *address*, *zone/address*, *section/address*, or *ID number* (Figure 3.1.28). A utility is provided for viewing and printing saved reports.



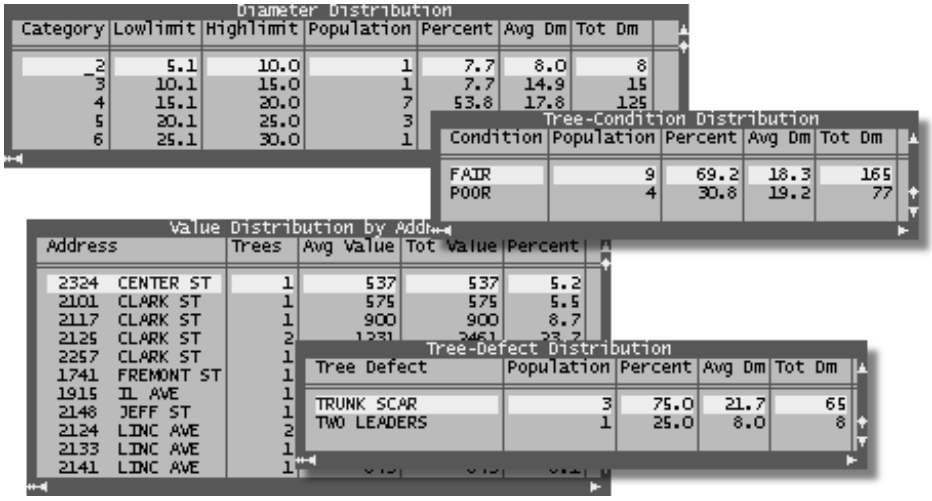
▲ *Figure 3.1.27: A queried tree listing of all American Elms with condition values of fair, poor, very poor, or dead.*

Analyzing tree lists

Trees listed in the **selected trees** screen can be analyzed by *species*, *family/genus*, *diameter*, *condition*, *maintenance need*, *defects*, *appraised value*, and *planting date*. Figure 3.1.29 indicates *diameter*, *condition*, *appraised value*, and *defect distributions* for the above query on American Elms. Diameter classes are specified before a diameter distribution is created. Output can be printed or saved to a text file.



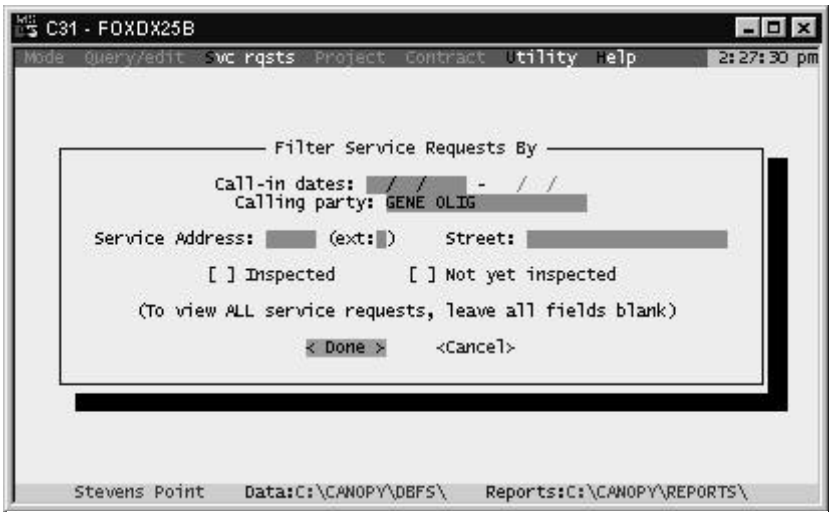
▲ *Figure 3.1.28: Tree list information can be saved to file or printed. Options are provided for sorting output.*



◀ *Figure 3.1.29: Diameter, condition, appraisal value, and defect distributions for all American Elms with condition values of fair, poor, very poor, or dead.*

Viewing service requests

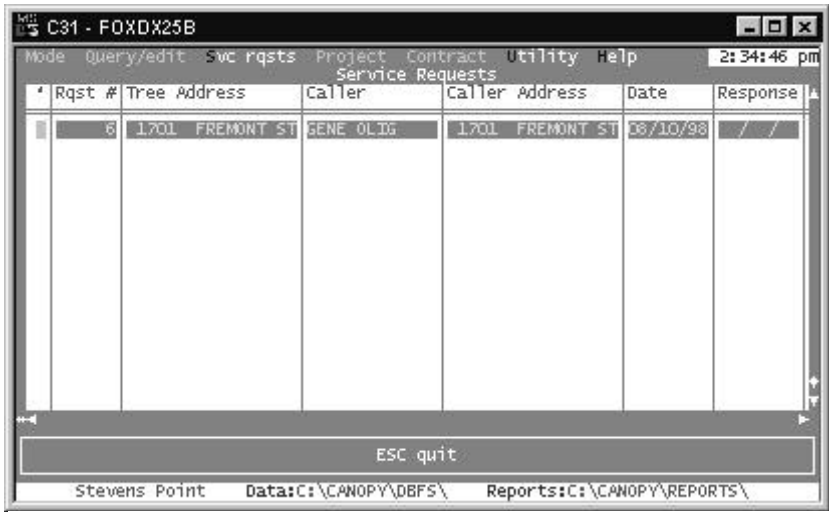
Service requests are searched in the **filter service requests** screen (Figure 3.1.30). A combination of *call-in date* range, *calling party*, *service address*, and *street* information can be entered to filter the search, or these fields can be left blank to list all service requests. Whether the service request was *inspected* can also be specified. Results are indicated in the **service requests** screen where information can be printed, edited, and field responses can be logged (Figure 3.1.31). Field response worksheets can be printed from this screen.



▲ *Figure 3.1.30: Service requests are searched by entering the desired information in the filter service requests screen.*

Logging service requests

A field response for a service request is logged through the **edit service request** screen (Figure 3.1.32). Tree sites at the address are indicated in the lower portion of this screen. Only the *notes* field can be edited for existing service request information. Field response information is entered in the **service request response** screen where the *response date*, *inspector* initials, and *maintenance* action must be entered. A response of *no action needed*, *assessed only*, *assign to project*, or *completed by staff* can be selected. A project must be assigned or created if *assign to project* is selected.



▲ *Figure 3.1.31: The results for a service request search are viewed, edited, and printed in the service requests screen. Field responses are logged through this screen.*

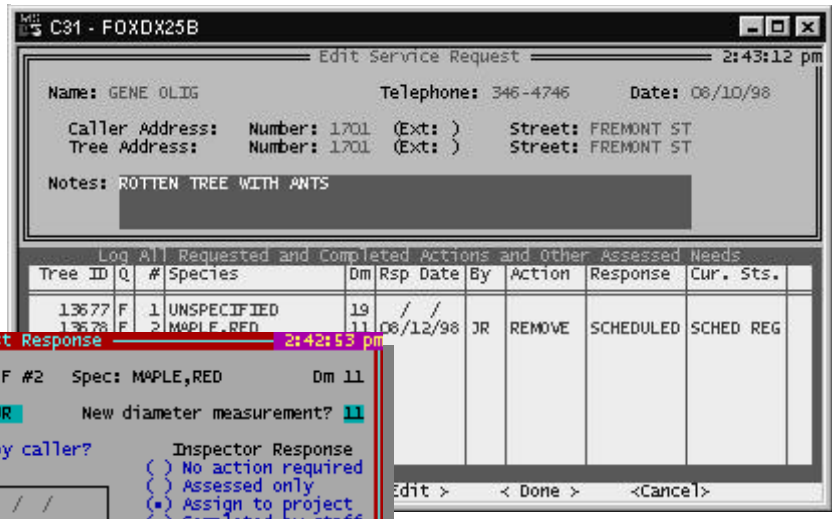
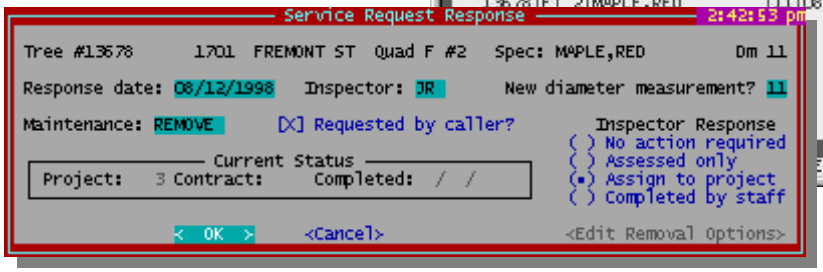


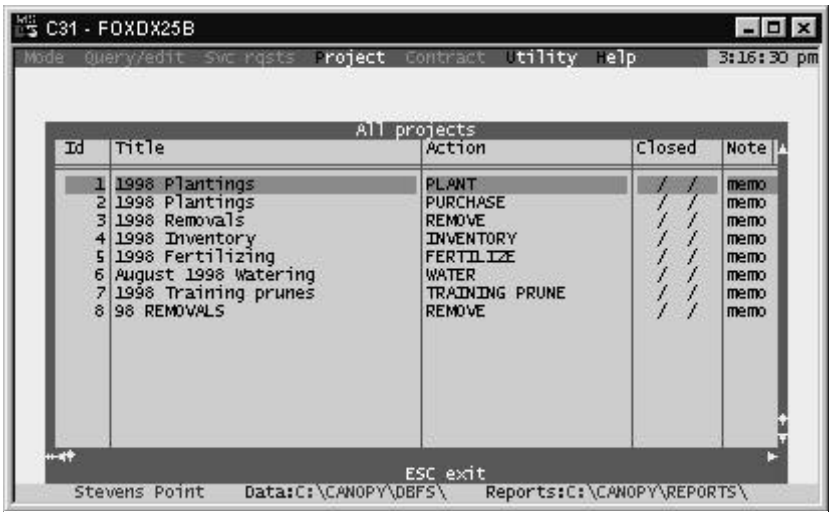
Figure 3.1.32: All tree sites at an address are listed when field responses for service requests are logged. If needed a service request can be assigned to a project.



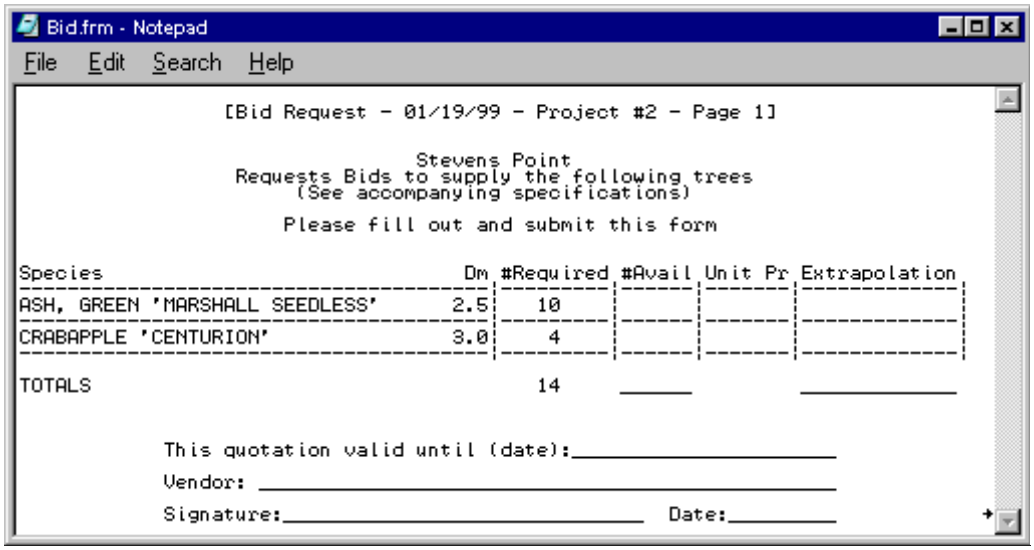
Viewing projects

An overview of the project database is indicated in the **all projects** screen (Figure 3.1.33). An option is also available for viewing only open projects. Project information includes *ID* number, *title*, *action*, closing date, and *notes*. Projects are edited and deleted, project tree lists are viewed, and additional projects are created through this screen.

When a project tree list is viewed an option is available for generating a bid form (Figure 3.1.24). The bid form can be printed for a vendor and saved to a text file if desired. Figure 3.1.34 indicates a generated bid form for planting purchases.

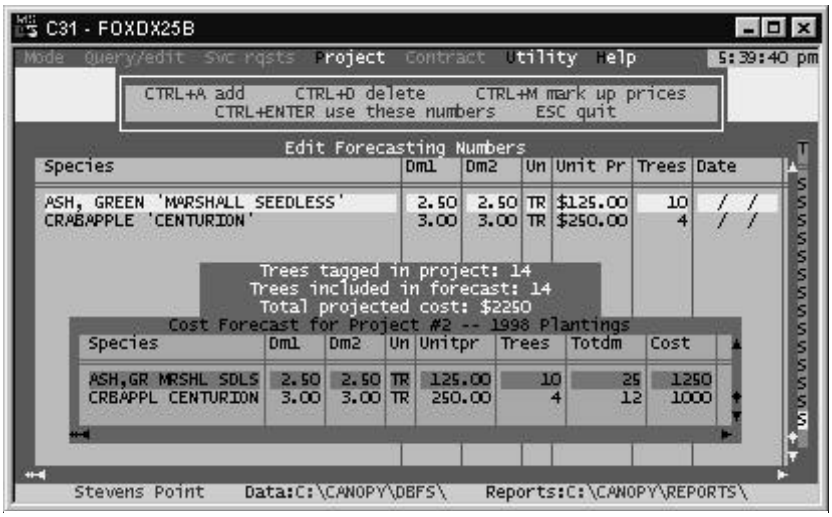


▲ *Figure 3.1.33: The all projects screen contains project titles, actions, closing dates, and notes for the project database.*



◀ *Figure 3.1.34: A bid form for projects can be generated and printed for vendors.*

The **project tree list** screen also contains an option for forecasting costs. The forecasting numbers are based on the bid details entered when adding the contract (Figure 3.1.26). Forecasting numbers can be edited before the forecast is created (Figure 3.1.35). Forecast results include bid details along with projected costs per bid category and total projected cost.



▲ *Figure 3.1.35: Costs can be forecasted based on previously entered bid details.*

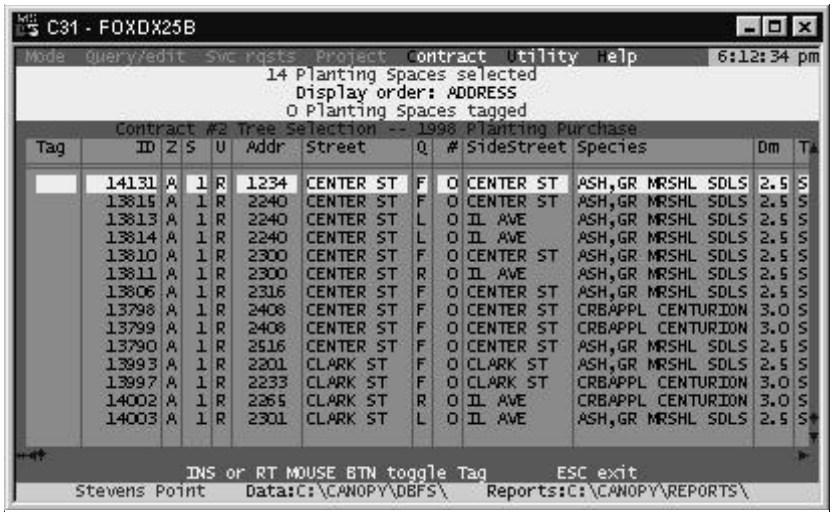
Viewing contracts

An overview of the contract database is indicated in the **all contracts** screen (Figure 3.1.36). An option is also available for viewing only open contracts. Contract information includes *ID* number, the associated *project number*, *title*, *action*, *amount*, *vendor*, and *status*. Contracts are edited and deleted, contract tree lists are viewed, and additional contracts are created through this screen.

A contract tree list can be viewed after trees are added to the contract through the **project tree list** screen (Figure 3.1.24). Information in the **contract tree list** screen can be printed, saved to a text file, edited, and deleted (Figure 3.1.37). Selected trees can be logged as completed for the contract, and *species*, *diameter*, and planting *type* fields can be edited if needed (Figure 3.1.38). A *purchase date* must be entered when logging completed trees for a contract. Contract and project statistics including number of trees, number of trees completed, and percent of trees completed can be viewed (Figure 3.1.39). Additional completion history information on a daily, weekly, and monthly basis can also be viewed. This includes the reporting interval start and end date, numbers and percentages for completed trees, and cumulative numbers and percentages for completed trees.

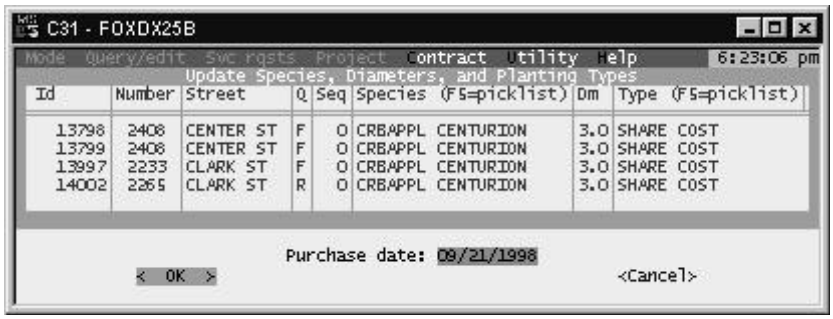
ID #	Prj #	Title	Date	Amount	Vendor	S
1	3	1998 REMOVALS	09/10/98	$10000	1st Choice Tree Service	0
2	2	1998 Planting Purchase	09/17/98	$2250	TREE NURSERY	0

▲ *Figure 3.1.36: The all contracts screen contains contract titles, dates, amounts, vendors, and associated project numbers.*



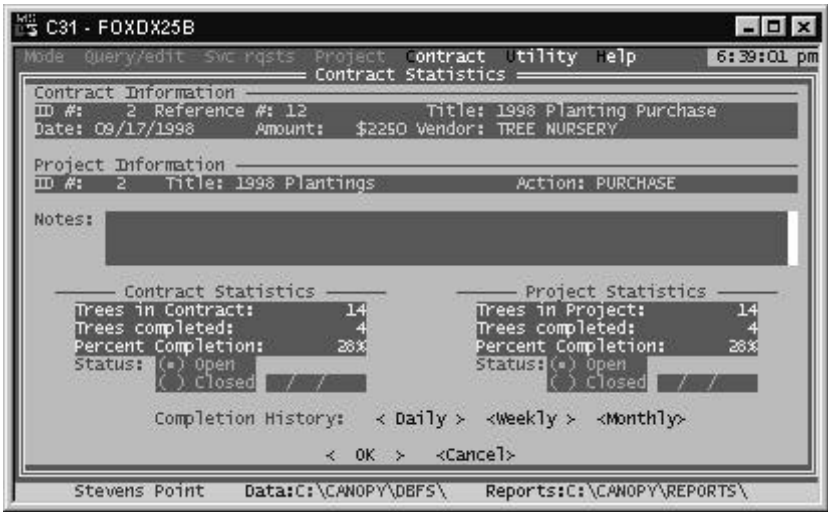
Tag	ID	Z	S	U	Addr	Street	Q	#	SideStreet	Species	Dm	T
	14131	A	1	R	1234	CENTER ST	F	0	CENTER ST	ASH,GR MRSHL SDLS	2.5	S
	13815	A	1	R	2240	CENTER ST	F	0	CENTER ST	ASH,GR MRSHL SDLS	2.5	S
	13813	A	1	R	2240	CENTER ST	L	0	IL AVE	ASH,GR MRSHL SDLS	2.5	S
	13814	A	1	R	2240	CENTER ST	L	0	IL AVE	ASH,GR MRSHL SDLS	2.5	S
	13810	A	1	R	2300	CENTER ST	F	0	CENTER ST	ASH,GR MRSHL SDLS	2.5	S
	13811	A	1	R	2300	CENTER ST	R	0	IL AVE	ASH,GR MRSHL SDLS	2.5	S
	13806	A	1	R	2316	CENTER ST	F	0	CENTER ST	ASH,GR MRSHL SDLS	2.5	S
	13798	A	1	R	2408	CENTER ST	F	0	CENTER ST	CRBAPPL CENTURION	3.0	S
	13799	A	1	R	2408	CENTER ST	F	0	CENTER ST	CRBAPPL CENTURION	3.0	S
	13790	A	1	R	2516	CENTER ST	F	0	CENTER ST	ASH,GR MRSHL SDLS	2.5	S
	13993	A	1	R	2201	CLARK ST	F	0	CLARK ST	ASH,GR MRSHL SDLS	2.5	S
	13997	A	1	R	2233	CLARK ST	F	0	CLARK ST	CRBAPPL CENTURION	3.0	S
	14002	A	1	R	2265	CLARK ST	R	0	IL AVE	CRBAPPL CENTURION	3.0	S
	14003	A	1	R	2301	CLARK ST	L	0	IL AVE	ASH,GR MRSHL SDLS	2.5	S

▲ *Figure 3.1.37: The contract tree list screen is used for printing, saving, editing, and deleting contract information. Trees can be logged as completed and contract statistics can be viewed.*



Id	Number	Street	Q	Seq	Species (F5=picklist)	Dm	Type (F5=picklist)
13798	2408	CENTER ST	F	0	CRBAPPL CENTURION	3.0	SHARE COST
13799	2408	CENTER ST	F	0	CRBAPPL CENTURION	3.0	SHARE COST
13997	2233	CLARK ST	F	0	CRBAPPL CENTURION	3.0	SHARE COST
14002	2265	CLARK ST	R	0	CRBAPPL CENTURION	3.0	SHARE COST

▲ *Figure 3.1.38: Completed trees are selected in the contract tree list to update species, diameter, and planting type information.*



◀ *Figure 3.1.39: Contract and project statistics are viewed in the contract statistics screen.*