Dwarf Therapist

Version 23.2 *Beta* Guide

Resident Mario

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Preamble

1 What's a Dwarf Therapist?

Dwarf Fortress is not an easy game to play, and many a stoic a gamer has fallen trying to learn how. A mind-bogglingly complex game wrapped in an extremely simple ASCII[1] character-based graphics set, Dwarf Fortress is renowned for being impossible to learn, impossible to play, and impossible to master, and so caters to a certain, how to say, esoteric crowd. Luckily the kinds of people that play Dwarf Fortress also happen to be the kinds of people that enjoy laboring over computer programs that, among other things, aim to make playing the game less of a painful experience. Dwarf Fortress's community has lovingly crafted countless tilesets, character mappings, mods, graphical visualizers, companion programs, launchers, debuggers, memory access tools, plug-ins, extensions, program packages, so on, so forth, you get the idea, to extend and empower this (projected) 20 year project of a game.

One such gamer is Trey Stout (or chmod, as he's known on the forums) and one such program is Dwarf Therapist. Initially released in 2009, the program solves one of the most basic and annoying problems with the game—the difficulty involved in setting Dwarven labor preferences. In the vanilla game, the only way to set dwarven labor preferences (probably the most important setting there is, dwarf- wise) was to get to the dwarf, get to their labors screen, and then crawl through a tedious menu bumping this labor off or this one on. A starting group of seven dwarves? Not fun, but in grander scheme of the game, doable. 200 of them running amok? No way. Dwarf Therapist solved this problem by providing a functional tabular interface, plugged into the Dwarf Fortress memory, which allows the reading, editing, and committing of dwarven labor changes.[2]

So, if all it does is manage dwarven labors, what's so difficult about it that it necessitates a fifty-plus page guide? As it so happens, chmod didn't release the basic version of Dwarf Therapist and leave it there. He continued working on it, polishing off its interface and new feature. When he retired from maintaining it in 2010, DwarfEngineer took over its development through 2012; Splinterz revealed his code fork of the program in February 2013, the currently standard therapy branch. Years of development have expanded the capacities of the program well past basic labor management and have turned it into a pretty comprehensive fortress management tool, of which tabular labor management is only the most obvious and immediately visible application. It's a program that's long since become complicated enough to necessitate a guide to go with it.

[1] Technically Code Page 437, an IBM ASCII expansion sometimes referred to as "extended ASCII".

[2] Dwarf Therapist was not the first such program of its kind; before it most players used a similar utility known as Dwarf Manager. But the program became outdated and fell out of use, and Dwarf Therapist became—and has remained—the de facto standard.

2 Installation

Different distributions of Dwarf Therapist are available for different operating systems. Dwarf Therapist is a large part of the standard Dwarf Fortress utilities package, so player packs containing the utility are also widely available.

Windows: Windows is the development operating system for Dwarf Therapist; a ZIP of the most recent version can be downloaded directly from the Dwarf Fortress File Depot: `http://www.bay12forums.com/smf/index.php?topic=126076`. The program will look through your active programs to try and find the game, so you should generally be safe running it from just about anywhere, even a thumb drive, but it's most logical to stick it in the Dwarf Fortress root directory—the one with the game's .exe file.

As of December 23, 2017, the standard Windows bundle for the game containing Dwarf Therapist is the Dwarf Fortress Starter Pack: `http://www.bay12forums.com/smf/index.php?topic=126076`.

OSX: Dwarf Therapist has been ported to Mac, and is available here: `http://dffd.wimbli.com/file.php?id=9127`.

The current standard starter pack for Mac is the MacNewbie Pack, available from here: `http://dffd.wimbli.com/file.php?id=7922`.

Linux: There is no standard Linux release. You can also build it yourself from the source with the instructions available here: `http://code.google.com/p/dwarftherapist/wiki/BuildingDwarfTherapist`.

3 About this Guide

The bulk of this guide was written by Resident Mario over the course of a few weeks in the summer of 2013, as a LaTeX exercise. In the summer of 2014 he made the document's source code public, with the hope is that in the future this guide will be maintained by the community, rather than any one busy and fallible author.

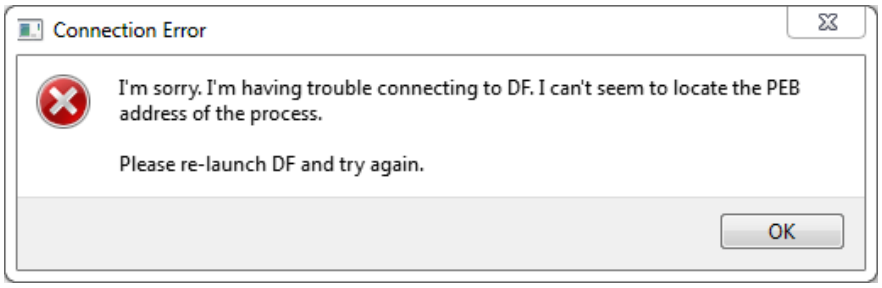
Splinterz has continued active development on the utility, and additionally the summer of 2014 saw the release of the next major version of Dwarf Fortress, two years in the works, version 0.40. As such, the version of Dwarf Therapist that you see now has been refined quite a bit over the one that was originally covered by this guide. Dwarf Therapist's capacities were exploited over the course of the writing of this guide in program-solving exercises, some of which, particularly in terms of the program's look and feel, have since been "solved" (often by the inclusion of features that the author themselves recommended). Some other usecases have since been included in the program's base installation. In order to maintain this guide's overall narrative format, for the most part the usecases used now are the same ones used when this guide was first written, even in cases where they may seem redundant or have since been hard-coded into the utility—just because the changes are no longer novel, doesn't mean that they aren't still useful exercises. Usually, a inset "legacy box" is provided to inform the reader that the default behavior has since changed, and to describe the way things "used to be".

Additionally, because Dwarf Therapist and Dwarf Fortress have been updated several times, in the latter case in ways that break compatibility with old saves, example illustrations may use old views until a new fortress can be played sufficiently in new release versions to generate the needed usecases.

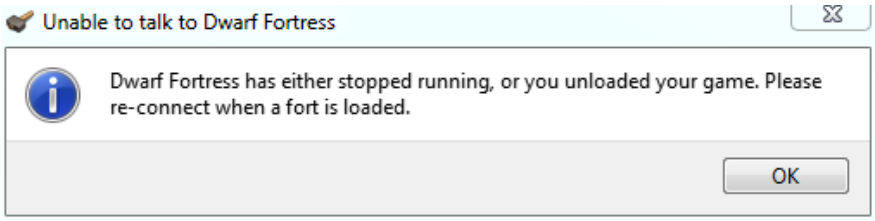
Part II
Basics

4 Connecting to Dwarf Fortress

Dwarf Therapist requires Dwarf Fortress to be running and an active fortress to be open within the game in order to work properly. You can open the utility without the game running or without a fortress loaded, but it will complain to you:



This is because before Dwarf Therapist can do much of anything useful, it has to connect to a running instance of the game; the only function that the utility can provide by itself is the ability to write filter scripts (which obviously can't be applied out-of-game), move the docks around, and change some settings. You'll get another, similar error message if you load a fortress, connect to the game, and then unload it:[3]



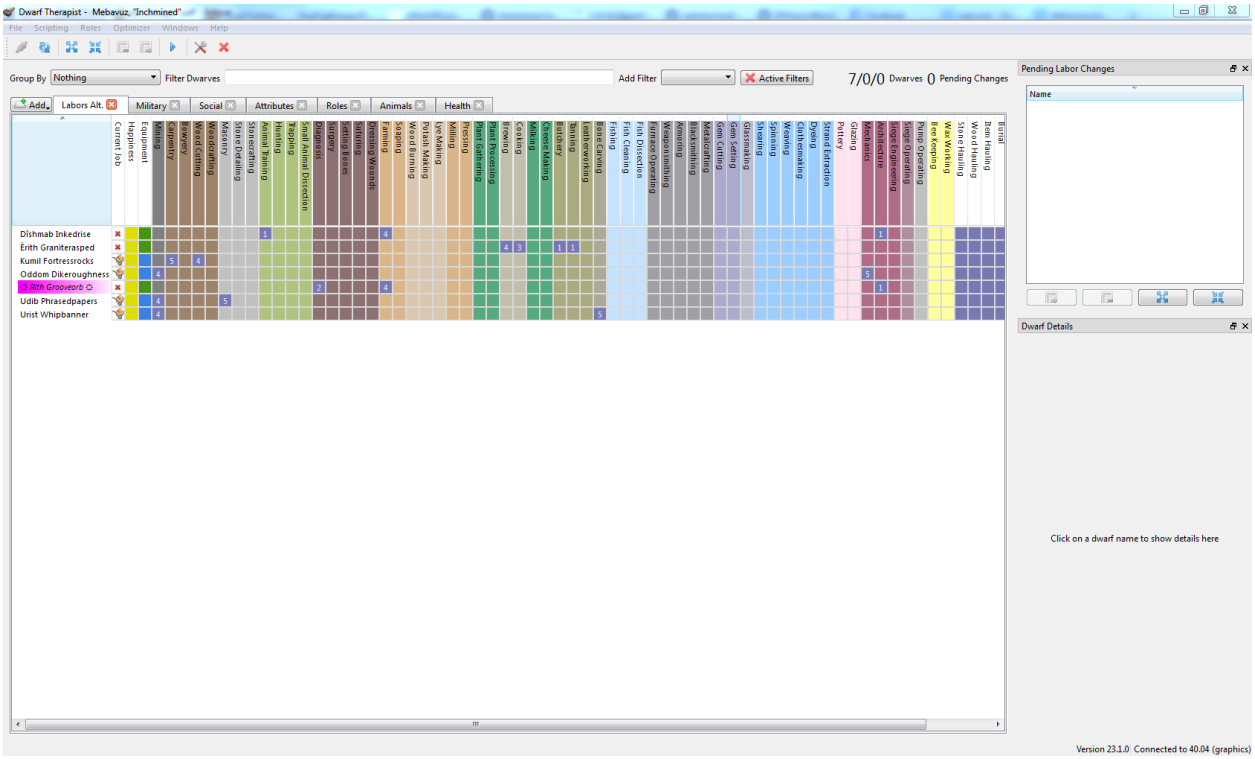
To avoid such messages you should generally launch Dwarf Therapist second and close it first, but it doesn't really matter too much—you can connect at any time using the "Connect to DF" button on the main toolbar. To keep its memory usage down, Dwarf Therapist connects to your game intermittently, loading data into the utility only when a fortress is first opened or when you request to do so. This is the function of the second button on the main toolbar, "Read Dwarves", which will easily be the most used item on your main toolbar.[4] Loading data into the game only takes a fraction of a second to a few seconds (depending on the size of your fortress) each time, and it can be done regardless of whether the game is paused or not—but since you're probably going to be spending some time on the Therapist screen once you switch to it, pausing is probably a good idea.

[3] This behavior can be disabled in the general options. However, this is no "offline" mode: cycling out of a fortress, making changes, loading it again, and then attempting to commit your offline changes will only cause the utility to crash.

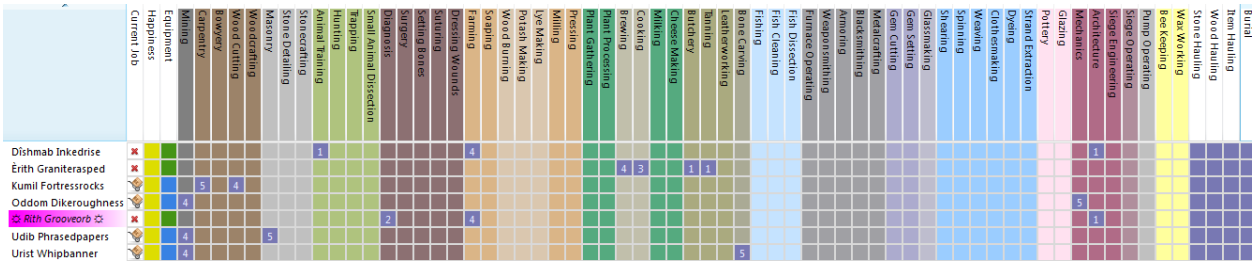
[4] Since Dwarf Therapist now lets you view animals, too, the name is a bit of an anachronism. If you mod your game and change the playable race, the button label will actually change with it—one of Dwarf Therapist's many mod-friendly features.

5 Main Display

Once you've connected to and loaded a fresh fortress into Dwarf Therapist, your screen should look something like this:



5.1 Labors View



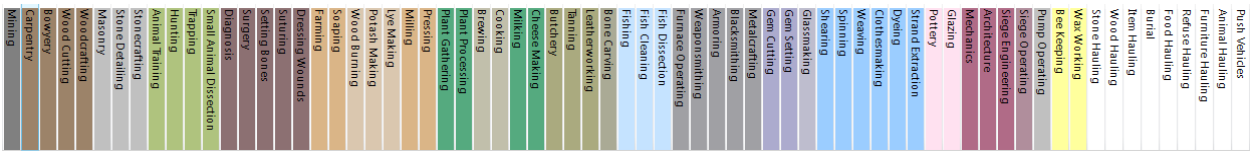
Most of the screen space is taken up by the the graphical management user interface (or *view*), the main window visible onscreen. Since we've only just created our fortress it doesn't have many members yet, and so most of the view is whitespace.

The labors view visible here is the most important and immediately accessible part of the program, and is the feature around which the rest of Dwarf Therapist is built. Toggling labor preferences has been the primary purpose of Dwarf Therapist from its very first release, and many users still use it for little else; but Dwarf Therapist has since become an expansive management utility with an extensive suite of tools and capacities that this guide will attempt to illuminate in greater depth.

It should be noted that there are more labor preferences available in the game then can be comfortably and compactly fit into the screen, necessitating that we contend with a scroll bar at the bottom of the screen

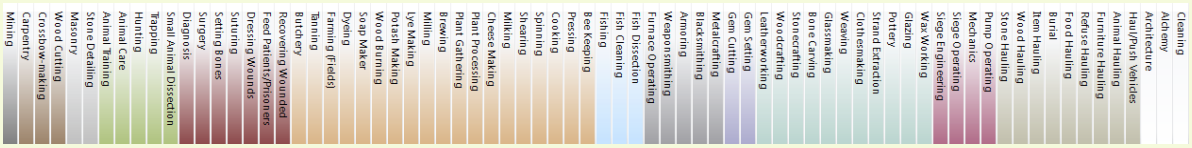
on all but the widest of monitors; a second one appears on the right once your dwarves get too numerous (vertically) to fit into the interface.[5]

Labors are organized into "tranches", with related labors categorized and sorted under industry allegiances roughly like the color assignments used by dwarves of those professions in-game:



These labors should be familiar to players of the game, as should be their categorical professions: miners, woodworkers, stoneworkers, rangers, doctors, farmers, fishery workers, metalsmiths, jewelers, craftsdwarves, engineers, and peasants.

In older versions of Dwarf Therapist, the default view sorted labors in the exact same order and with the exact same colors that Dwarf Fortress sorts them:



The view is still available in the view add dropdown menu as the "Labors Alt" view. It has been replaced as the default by the more polished "Labors" view, written over the course of this guide (see **"Custom Grid Views"**) and then introduced into Dwarf Therapist as the new default shortly thereafter.

To the left of the labor columns are dwarfwise informational columns: a gendered list of your dwarves, alphabetically ordered, flanked by a color gradient for their equipment status, icons representing their (current) job, a color gradient their happiness, and another set of icons their profession. Since we jumped into this view immediately after our fortress disembarked, our dwarves have neither jobs nor variance in their happiness just yet, but they do exhibit the different professions I've selected for my starting set. Dwarves which reach legendary status in at least one skill will have their names displayed in boldface. to distinguish them from their "lesser" brethren.

Clicking on a headers at the top of the screen for any of the columns allows us to sort the list by that column; click on it again to reverse the sort order, or on another column to go to that sort instead. The name spacer lists your dwarves alphabetically, the job header sorts them by Job ID, happiness by happiness level, and equipment by whether or not they are fully clothed and, if their job requires a tool, have that tool at hand.[6] Hitting the actual labor columns will sort your dwarves in two tiers, first dwarves with that labor enabled by their experience level, then dwarves without it enabled by the same metric.[7] If *none* of your dwarves have experience in a task, sorting won't actually do anything.

Within the grid itself the numbers demarkate the skill level of the dwarf at a task while the shading tells you whether or not they have it enabled. Try clicking on a few of the cells and seeing how the program responds—getting labor changes into the game should be entirely intuitive, even if we're not going over it in detail just yet.

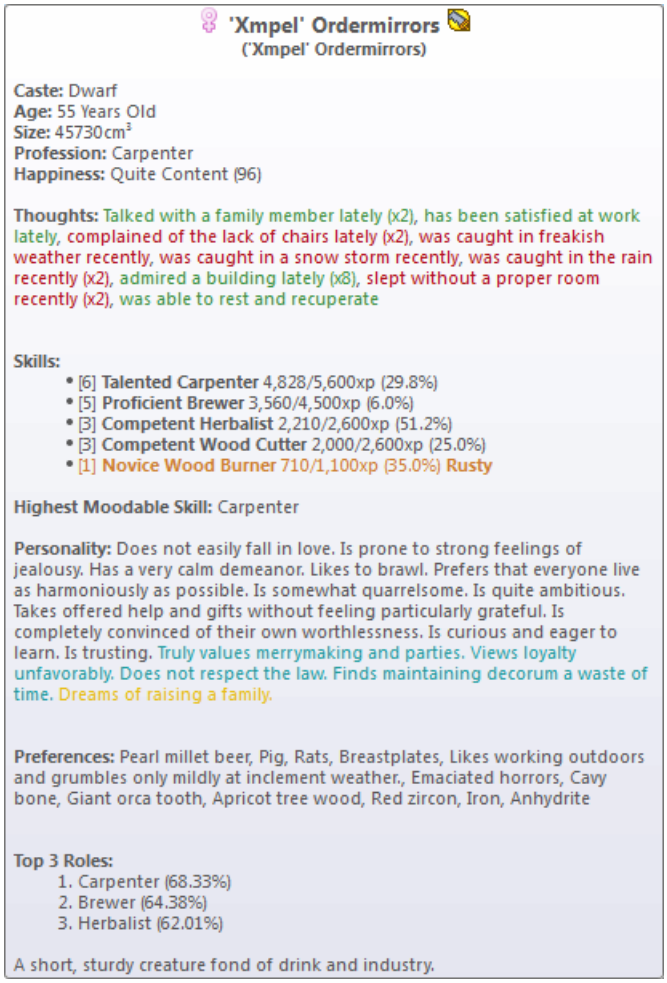
[5] For tips on formatting your display for compactness, see the section **"Formatting Your Display"**.

[6] Job IDs and the related Profession IDs are somewhat abstract lists of jobs and professions, respectively, whose modification we will discuss much later in this guide. For further reference, see **"Modifying Game Data"** in the appendix.

[7] Dwarves accumulate experience levels and "rank up" their skill level every time they pass a certain milestone.

One major feature of the grid interface is its tooltips, which pop up whenever you hover over a space in the grid. Hovering over the labor column headers will tell you how many dwarves have that labor enabled, while hovering over individual labor cells will display the descriptive (Dabbling, Novice, Adequate, Competent, etc.) and raw (0, 1, 2, 3, etc.) skill that dwarf has in that labor, their cumulative experience and progress towards the next skill level, whether or not that is their highest moodable skill, and (if they are legendary from a strange mood) the name of the artifact they crafted; if the skill has rusted, that information will appear here as well.[8] Hovering over a dwarf's happiness gives you a dwarf's exact happiness score, hovering over their current job gives the numerical ID of that task, and hovering over their equipment gives you their current clothing and tools carried.

By far the most information-dense tooltip on display is that of the dwarves themselves. Hovering over a dwarf's name will give you their caste, [9] gender, profession, happiness level, thoughts (color coded green when good, red when bad), skills (rust will be highlighted), personality, preferences, and their calculated "Top 3 Roles" (covered later, see **"Roles"**). The dwarven caste description, more or less memorized by the community, also makes an appearance, at the end of the tooltip. The information to be displayed here can be included or excluded as you please by adjusting the appropriate settings in `Options > Tooltip`.



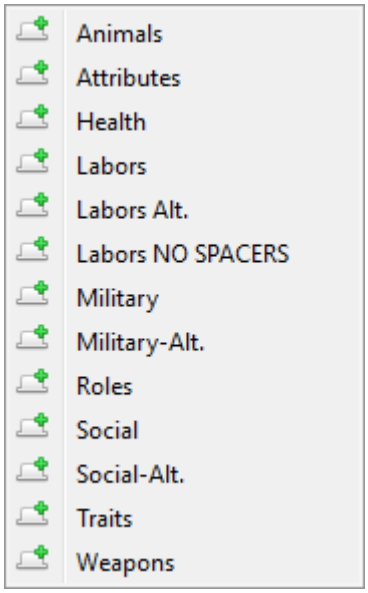
[8] **Skill rust** occurs when a dwarf has not performed the labor associated with a skill for a long time. Dwarves whose skills are "Very Rusty" will eventually see their skill in the labor drain away or even vanish completely.

[9] **Castes** are raw file definitions used to define species or sub-species, and are not very useful in vanilla Dwarf Fortress: but having a display for them is handy if you're using mods and have fiddled with your playable race.

5.2 Views

Immediately above the labors screen is the screens tab:

Although the Labors view is the core of the interface, and is the tab open by default, there's a number of other screens built into the utility, all of which are available for your use. The screens tab has several of these tabs open by default, and more are available under the "Add" menu in alphabetical order. The tabs can be moved around, deleted, and re-added as much as you want, and the utility will save their state between instances, allowing you to keep your favorite tabs around where you'd like them. You can also have multiple instances of a tab open—although this isn't a particularly useful feature, it's there. A list of the screens and what they do follows:



Animals: Lists domestic, caged, and tame creatures and their attributes. Includes whether or not they are marked for butchering and whether or not they are caged. Distinguishes between children and adults, and lists current training levels. This view is unique in that it is the only one not directed at your dwarves.

Attributes A basic list of attributes. Tranches are physical, then mental.

Health A detailed breakdown of all of your dwarves' wounds and ailments.

Labors A compressed alternative to the legacy Labors view that was originally created as part of this guide, and has since been packaged into the utility as the new default: see the section **"Creating Your Own Grid Views"**.

Labors Alt The Labors View is the program's legacy primary view—for a detailed description see **"Labors View"**.

Labors NO SPACERS Same as the Labors view, but without any spacers between the categorial professions, winning back some screen space.

Military Allows you to view your dwarves' combat ability. It lists the relevant combat skills in melee, fighter, equipment, miscellaneous, and marksdwarf tranches, then gives you a view of their combat-related attributes, then their compatibility scores for various combat roles, then which weapons they are or are not able to equip based on their relative size.[10]

Military-Alt Expands on the regular Military view by including role ratings.

Roles Lists the role ratings of your dwarves, a score out of 100 that tells you how adapted they are to that profession. This view is discussed in **"Using Roles—The View Method"**.

Social Catalogues your dwarves' social skills. The tooltip lists related roles, which are only present for some of the social skills.

[10]Theoretically all the but the runtiest of dwarves are able to wield all but a few especially large non-native weapons one-handed; however, because of a bug, in Fortress Mode *no* dwarves can wield two-handed weapons, ever.

Social-Alt Expands on the regular Social view by including role ratings, as well as a non-social trait columns for traits are affected by social traits. For example, Assertiveness is added and grouped with Persuader, because having low assertiveness means it's impossible to increase the persuader trait.

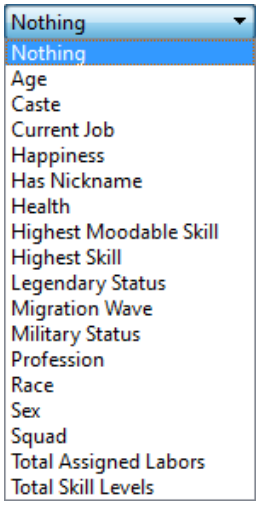
Traits This is a special view that lists raw role ratings; see above.

Weapons Lists dwarves by which weapons they can wield. This view is dynamically generated: in vanilla it acts as a subview of the military view, but mods with large amounts of weapons will look significantly more expansive. Additionally, the weapons view will be tacked on to the military view as well if there are ten or fewer weapon groups.

5.3 Group By and Filters

Filter scripts are an advanced topic covered in **"Filter Scripts"**, and will not be covered in depth here. For now, know that the "Filter Dwarves" input field is the quickest way to find individual dwarves by name.

The Group By menu, meanwhile, changes what your dwarves are sorted by in the views, and is fairly intuitive, mostly useful for examining various demographic breakdowns of your fortress. Options are:



Nothing, the default.
Age, in tiers of ten.
Caste, all dwarves in vanilla outside of the Animals view.[11]
Current Job, a breakdown of the stuff your dwarves are doing.
Happiness, the sort does a better job.
Has Nickname, yes or no, useful when you're naming dwarves.
Health, health status.
Highest Skill, a demographic sort.
Highest Moodable Skill, useful when grinding for a legendary armorsmith.
Legendary Status, yes or no.
Migration Wave, the utility's best historical sort, and therefore a go-to grouping.
Military Status, active, off duty, can activate, or noble.
Profession, perhaps less useful than the equivalent sort.
Race.[12]
Sex.
Squad, No Squad or *Squad Name*.
Total Assigned Labors, a numerical statistic.
Total Skill Level, another numerical statistic.

When a group is active it will be expandable and collapsible, and in the collapsed labors view will display the lowest happiness of the group as well as (for each skill) if anyone in the group has the skill enabled, resulting in a darkened box with a numerical dwarf count or, if they all have it enabled, in a green box. This feature can be toggled on or off in the options. Groups consisting entirely of children will appear bright green. For more on using groups, see **"Using Groups"**.

[11] When mods are active an additional "Caste Tag" option becomes available, useful for finding hidden or secret castes that may exist.

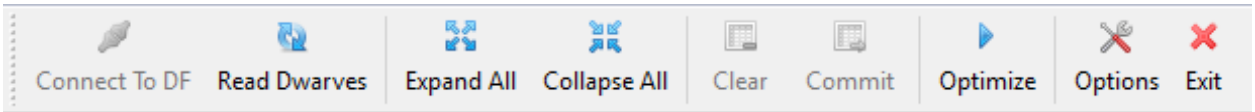
[12] A creature's race is defined off of its raw file, and will be the same as its caste in most cases. The exception is when a sub-special caste exists—in which case, race and caste does in fact diverge.

5.4 Population Indicator and Status Bar

The population indicator in the top-right corner of the window gives an at-a-glance view of how many dwarves there are in your fortress, distributed adults/children/babies, and the number of currently active pending changes (refer to **"Managing Your Dwarves"**). This lets you keep track of the number of changes you have pending, though not their nature, without having to pull out the "Pending Changes" dock (see **"Docks"**).

The basic status bar at the bottom of the window provides row and column information on the left, and a dwarf selection count and Dwarf Fortress version type information on the right.

5.5 Main Toolbar



The main toolbar presents the most important "shortcuts" the program has to offer. Except for the Optimizer, all of the toolbar items have an associated hotkey. Right clicking on the main toolbar allows you to toggle it (and docks, covered in the next section) on and off, and it can also be accessed under the "Window" menu in the main menu.

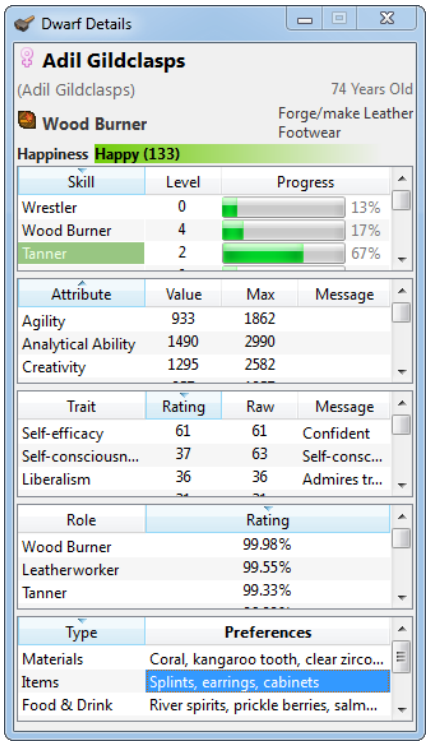
- **Connect to DF**: If Dwarf Therapist is not already connected to Dwarf Fortress, this will attempt to connect the program. If it is, this will be grayed out. Shortcut `Ctrl + C`.
- **Read Dwarves**: Reads the current state of the dwarves in your fort into the Therapist. Shortcut `Ctrl + R`.
- **Expand All**: Expands all group views; if Group By is set to "Nothing" this will have no effect. Shortcut `CTRL + >`.
- **Collapse All**: Collapses all group views, doing the opposite of the above command. Shortcut `CTRL + <`.
- **Clear**: Clears all labor preference changes (see **"Managing Your Dwarves"**). Shortcut `Ctrl + E`.
- **Commit**: Commits labor preference changes (see above). Shortcut `Ctrl + T`.
- **Optimize**: Runs an optimization plan. Optimization is an advanced topic covered in **"Optimization Plans"**, and this option does not appear on the toolbar at all if you have no optimization plans defined.
- **Options**: Allows you to adjust settings. Will be covered in the section **"Options"**.
- **Exit**: Exits the application.

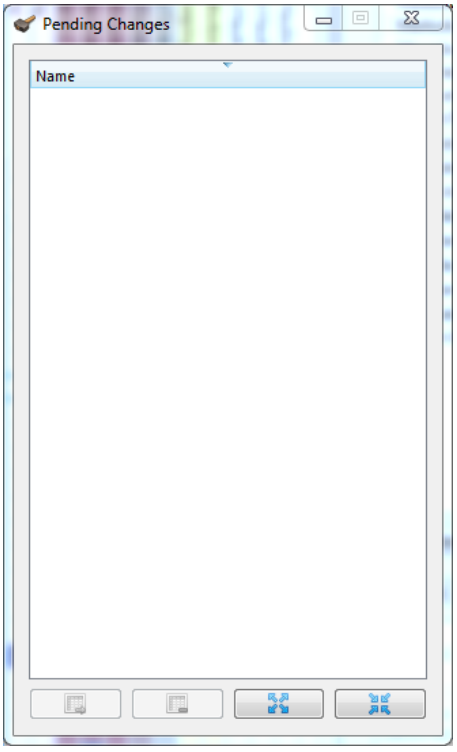
5.6 Docks

When you first open Dwarf Therapist, the right side of the screen will host a couple of docks. These two marvelous boxes are used to keep pace with what you're doing and modify how Dwarf Therapist works in various ways. Up to a trio of docks can be attached to the right side of the screen, and others can be pinned against other cardinal directions (or simply left floating around). Clicking the window button detaches the dock and leaves it to float, while clicking on the X button closes them, giving the others more room. If you don't have any docks at all pinned to a the right side, the main view will expand to make use of the new screen space.

By grabbing and dragging a dock you can actually attach anywhere on the screen—to the left, above, below, or to the right of the main view. By grabbing and dragging it into another dock, you can tab them, so that the dock that is currently open gets to monopolize the screen space. And the current dock configuration is saved between instances of the program, of course. Note that the main menu is actually also a dock, albeit one that must stay independent when docked, and so can be moved anywhere or even gotten rid of entirely. A list of docks follows:

Dwarf Details This one lists a lot of stuff, so if you use it you should tab-dock it. Dwarf Details provides an expanded view of a dwarf's abilities, providing pretty much all of the information on their capacities in the various views (and then some) in one comprehensive tabular form. You've got name, translated name, age, profession, current job, happiness level, skills table with progress bars, attribute table with maximum trainable value and message text, raw trait value with message text, top ten role ratings, and a table of the dwarf's preferences.





Pending Changes This dock displays which labors you are turning on or off in a tabular form, and allows you to commit or clear your changes independent of the main toolbar. Originally called "Pending Labor Changes", the dock has been renamed in lieu of the fact that it now also displays, and allows the manipulation of, nickname, profession, and squad assignments, all things we'll discuss in time. There are also

buttons for expanding and collapsing changes displayed in the dock, useful when making mass labor swaps. For a discussion on the basics of dwarven management (getting there!) see **"Managing Your Dwarves"**.

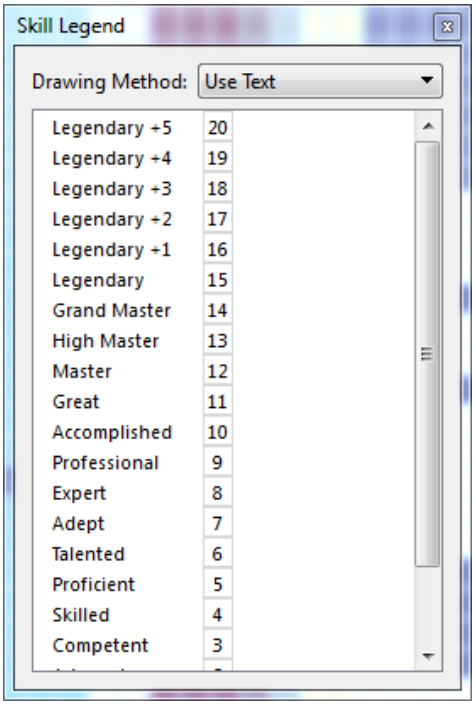
Customizations This dock allows you to create, edit, and manage custom professions, custom icons, and super-labors, all things we'll discuss later in this guide. For a discussion on creating custom professions, the first of the trio we'll cover, see **"Creating Custom Professions"**.

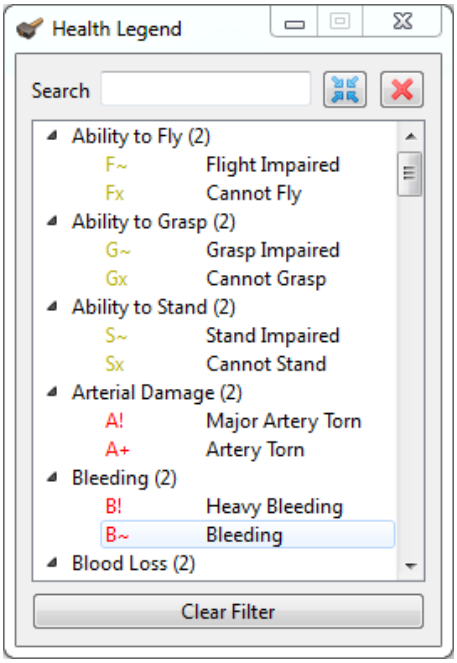
Grid Views Allows you to open grids from a menu, or create entirely new ones of your own design. See **"Creating Your Own Grid Views"** for more.

Skill Legend Provides a legend for skills display onscreen, and allows you to quickly change it with a drop-down menu. Only really there for completeness.

Preferences : Lists your dwarves by preferences, and allows you to search through them by object of preference. Clicking on one or more of the preferences allows you to filter dwarves so that only those with that preference are displayed on-screen (and Clear Filter obviously clear the filter).

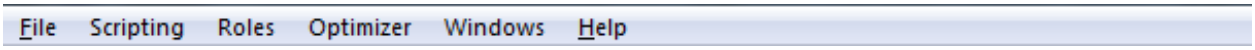
Thoughts Similar to the Preferences dock, this brings up popular thoughts by count, allows you to search through them, and allows you to filter your dwarves by them.





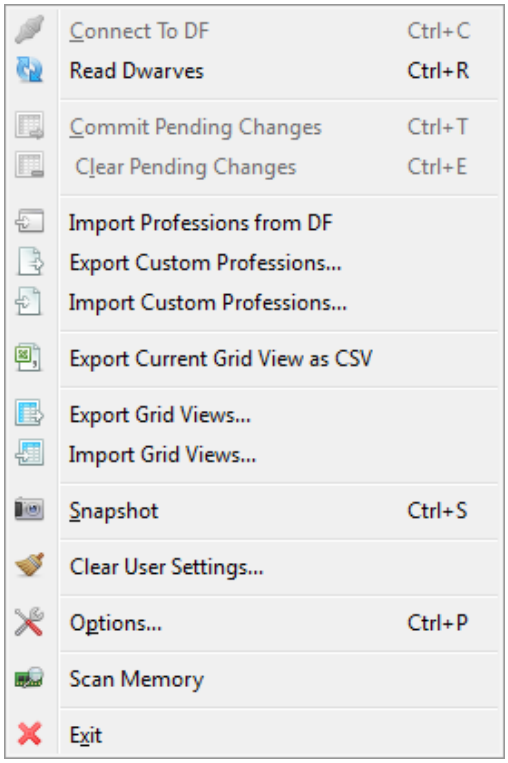
Health Legend The health legend allows you to filter your dwarves by health status, using the information provided in-game by the health screen. The dock includes mundane irregularities such as hunger and thirst as well as rather severe conditions like missing limbs and paralysis. This information is summarized in the Health view.

5.7 Menu Bar



The last piece of Dwarf Therapist we're going to analyze is the iconic menu bar (or taskbar), present on almost every real application ever written. I'm going to give a brief list of what's in it here, and direct you to the sections for specific functions when appropriate.

File provides a smorgasbord of options:



Connect to DF `(CTRL + C)` See **"Connecting to Dwarf Fortress"**.

Read Dwarves `(CTRL + R)` See link above.

Commit `(CTRL + T)` See **"Managing Your Dwarves"**.

Clear `(CTRL + E)` See link above.

Import Professions from DF See **"Exporting and Importing Professions"**.

Export Custom Professions See link above.

Import Saved Custom Professions See link above.

Export Current Grid View as CSV Exports the current view as a "comma exported value" spreadsheet, which is a basic `TXT` that can be read by almost any spreadsheet software.

Export Grid Views Exports, in Dwarf Therapist's `DTG` export format, a chosen selection of grid views to a chosen file location. See **"Exporting and Importing Grid Views"**.

Import Grid Views Imports `DTG` grid views from the disk. **"Exporting and Importing Grid Views"**.

Snapshot `(CTRL + S)` Takes a snapshot of the currently active Dwarf Therapist window, and stows it away where you tell it. Basically an extended version of the `PRNT SCR` key.[13]

Clear User Settings Deletes all user settings and then exits Dwarf Therapist. This restores all settings in the program back to default and erases all data, which is why it has a warning screen—it can be very damaging if you have complex scripts and other goodies programmed into the utility.

Options `(CTRL + P)` Also provided on the Main Toolbar; see **"Options"**.

Scan Memory See **"Addendum: Memory Tools"**.

[13] This option is functionally limited to full-window shots, and so should not be used too extensively—the screenshots for this guide, for instance, were done with Greenshot.

Exit Immediately exits the program.

Scripting provides facilities for generating Filter Scripts to apply to your dwarves. For a detailed discussion on Filter Scripts, see **"Filter Scripts**".

Roles provides facilities for creating, modifying, removing, importing, and exporting custom roles. For a detailed discussion on Roles, see **"Roles**".

Optimizer allows the creation, modification, deletion, importation, and exportation of Optimization Plans. For details, see **"Optimization Plans**".

Windows allows you to modify the docks and main toolbar displays in a manner similar to right clicking on the main toolbar. For more information on Docks, see **"Docks**".

Help provides links to a few different helpful resources:

Project Homepage Provides you with a link to the project homepage: `https://github.com/splintermind/Dwarf-Therapist`.

Discussion Forums Provides a link to the master Dwarf Therapist forum thread: `http://www.bay12forums.com/smf/index.php?topic=122968.0`.

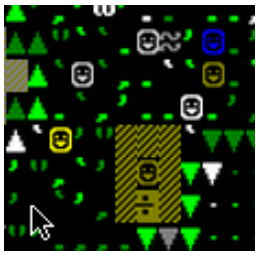
Request Feature / Report Bug Provides a link to the Dwarf Therapist issue tracker: `http://www.code.google.com/p/dwarftherapist/issues/entry/`.

Donate For buying the poor developer a beer through PayPal.

About Brings up a small splash screen giving you the Dwarf Therapist version number, some accreditation links, and a link to check for updates.

6 Managing Your Dwarves

Now that we've finally pinned down all the wayward bits of Dwarf Therapist and explained, though in some advanced cases quite briefly, what each of them does, we are in a position to discuss the game's primary source of utility: its ability to change the game's dwarven labor preferences, without having to deal with the game's clunky dwarfwise interface. This section will cover the basic tenets of dwarven management and demonstrate why even when Dwarf Fortress updates that have been in the works for a year or more are released, many people still refuse to play until Dwarf Therapist is updated to match. If you've already gotten dwarven labor management down pat, you can skip ahead to **"Options"**, or to **"Advanced Features"** if you're itching to try out the program's more advanced features.



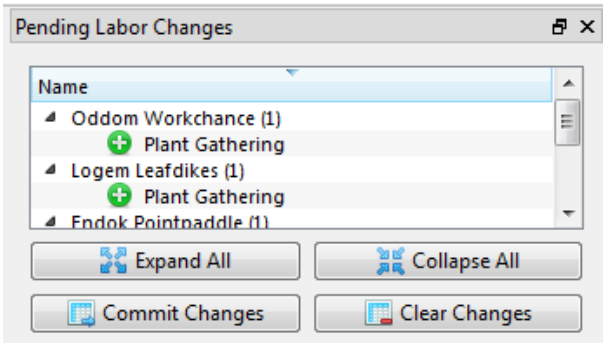
Dwarves frolic by the caravan.

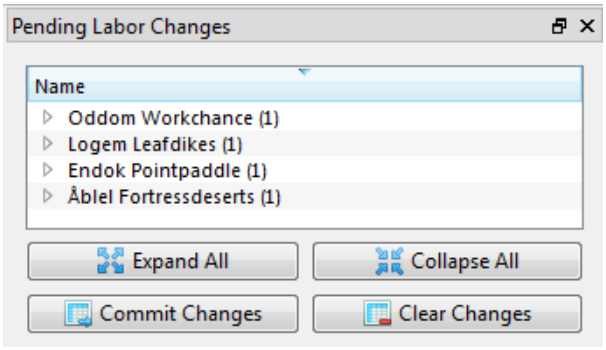
6.1 Making Labor Changes

Now let's return to the seven humble dwarves we touched upon at the beginning of this guide, illustrated above. We've got two miners, a carpenter/woodcutter, a mason, a stonecrafter/broker, and two farmers. The woodworker is soon to be off cutting wood, and the two miners are soon to be off digging—but what should the other four dwarves do? The facilities for their professions haven't been built, and there's nothing to haul around yet. This is a recurring problem, but I look around and see that there are plenty of bushes lying around that can be stripped for some free early food (and seeds for an above-ground farm, later on). So I designate some plants for gathering, and then change the labors to get my dwarves to do some work for me.

Individually designating dwarven labors for changes is as simple as clicking on the boxes that correspond with that dwarf and that task in the labor view. The box with either fill or unfill and will be surrounded by a bright red border, and the exact nature of the labor changes will be added to the pending labor changes dock if one is present on your screen and notched onto the Pending Changes counter near the top right of your screen; the Clear and Commit buttons on the main toolbar will greenlight as well. The changes that we would like to make and how they appear on-screen are highlighted on the left. To revert a change you're making—if, for instance, you accidentally toggle Plant Gathering on for your Carpenter, when what you really want him to be doing is chopping trees—just click on it again to revert it to the previous state.

We've made some labor preference changes, but right now they're only hanging around in the "Pending Labors" queue in Dwarf Therapist. To make them actually appear in the game, we have to **commit** these changes. Here's what the changes we want to make look like in the Pending Labor Changes dock, expanded for clarity and collapsed for compactness (which is what the buttons do, if you didn't know already):





You can remove the need for collapsing changes by giving the dock a bit more breathing room.

Hitting "Clear Changes" will clear all of these changes and wipe Dwarf Therapist to its previous state, while hitting "Commit Changes" will send the new labor orders through to the game, updating Dwarf Therapist to reflect the changes and producing immediate results. These buttons are available on both the Pending Labor Changes dock and on the Main Toolbar, however they also have hotkeys: `Ctrl + E` and `Ctrl + T`, respectively. Since these are two of the most common operations you'll be conducting with the program, it's probably a good idea to remember these hotkeys—it will save you a lot of time (refer to **"Hotkeys**" for the list of available hotkeys).

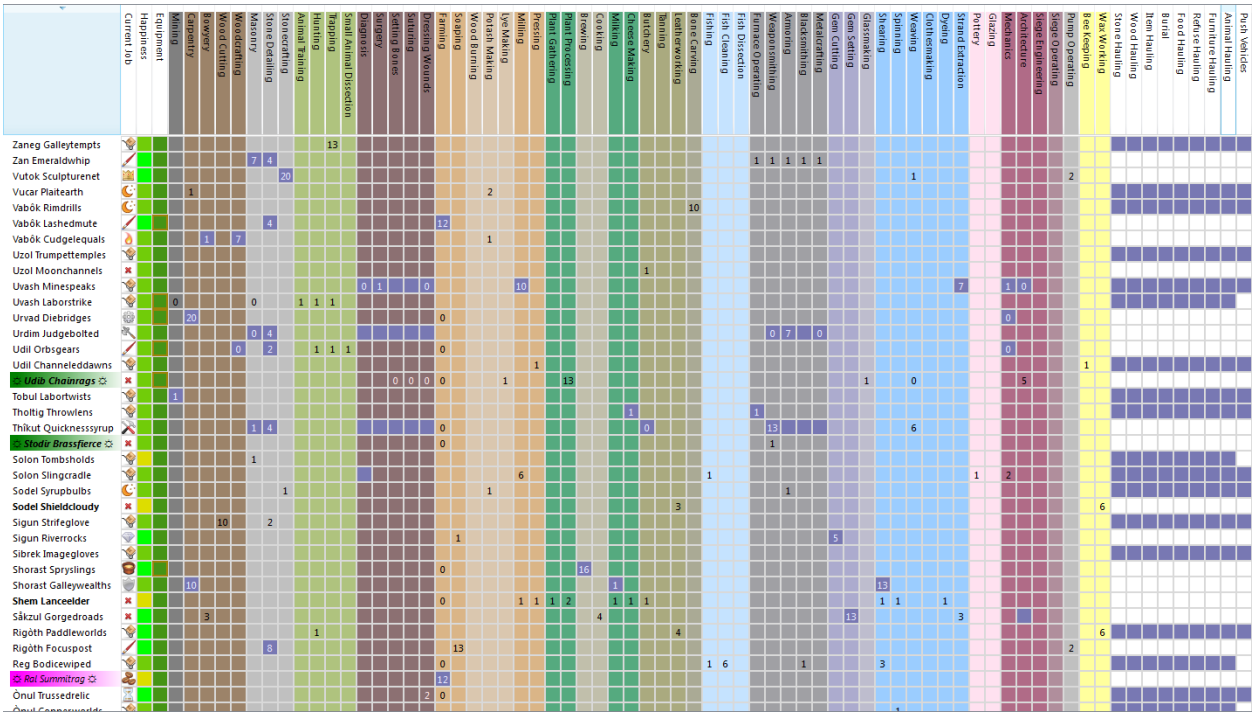
Dwarves start off with certain labors enabled: labors they have above-dabbling level skill in, hauling labors (including the two medical ones), and cleaning are always going to be set to on. The presence or lack of hauling labors especially is a concern: if we want the dwarf to be entirely focused on their primary tasks, these should be turned off, but if you want them to help with hauling away loose stone, feeding the wood stockpiles, and so on, then these should be turned on. For instance, I always dedicate my miners 100 percent to their task, and turn off all of their other (non-cleaning) labors. But there's a lot of small hauling labors, and turning them on or off individually is a pain. One solution is to hold down the mouse button and drag your cursor across the labors: this will toggle every labor you pass through on or off. But it's still not that fast, and it's pretty easy to mess up and accidentally toggle a nearby dwarf's labors on or off with it, which requires backtracking, which is a waste of time.

Thankfully, there's a better way! Go to any one of the labors in the tranche and right-click on it. Lo and behold, an option to toggle all jobs in that grouping on or off appears! I'm going to use this now to quickly and seamlessly turn off hauling for my miners, and dedicate them to their labors. This toggle feature is mostly useless for professions labors, but devilishly handy for designating hauling on or off when and where you need it.

Mischief, managed.

6.2 Using Groups

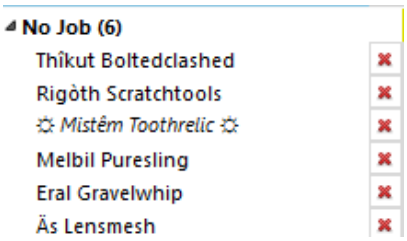
Now, picking out who's who on the labors view is easy enough when there's just seven dwarves to deal with. But it becomes quite a bit more problematic when there's say, seventy of them running amok:



Who's who? Beats me.

This is when two of the built-in sorting features of Dwarf Therapist, Groups and Sorts, become useful (you can also use filters, but that's a more difficult topic for later: see **"Filter Scripts"** if you're impatient).

First, let's talk in terms of Groups. Groups are described in brief in the **"Group By and Filters"** section of this guide, somewhere way above here: refer to it again if you need a refresher. Right now I return to the game screen and discover that six of my dwarves are idling—not bad in fortress of this size, but I've always been one to keep my dwarves' hands as busy as possible; don't want them making friends in my dining room and then tantruming about it later. Maybe it's a lost cause - it appears all the useful ones are out partying—but we'll try anyway.[14]



In a large enough fortress, trying to find out which dwarves are twiddling their thumbs is a fantastically annoying chore. Luckily, we can simplify the task for ourselves by grouping our dwarves by their current job. Going to the "Group By" drop-down menu and selecting "Current Job" will nicely clump our dwarves by—what else—their current jobs. After a little bit of snooping, I'm able to figure out what the problems are. We've got three jobless Miners with nothing to mine, a Woodcrafter (but really Thresher) with nothing to process, a Metalcrafter with nothing to craft, and a Ranger with nothing to haul. The Ranger will very soon find himself work, a spot of designation gets the Miners up and at it again,[15] and I add some processing jobs to an idle Farmer's Workshop. Bam; idle hands, managed! Ah, but

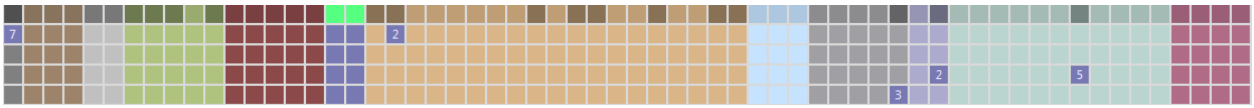
[14] Actually you can stop a party dead in its tracks and return the partying dwarves to their labors by freeing the room in which the party is taking place, and then redesignating it. The more you know...

[15] I cannot recommend the utility DFHack, and specifically its digv command, enough. It makes digging designations *so* much easier!

what's this:

Migrants! What are we going to do with them? After letting them get used to my fortress surroundings, I open up the Dwarf Therapist, group by Migrant Wave, open up the new guys, and am now ready to do some easy-to-make-out management; as an added bonus it'll tell you exactly how many dwarves you're getting this season. Dwarves are loaded into the memory the instant the message appears, so they don't actually have to be on your map yet for you to start working with their labor designations—a neat feature.[16]

Now, whenever you group your dwarves the top row will consist of a collapsible group name and header, and a series of labor boxes that, based on whether they'll filled out or not, tells you which labors have been enabled within the group. Since these are new migrants and I haven't make adjustments yet, it basically tells me what skills the random number god has gifted me with this migratory wave:



Unfortunately Armok has not graced me with an armorer this season.

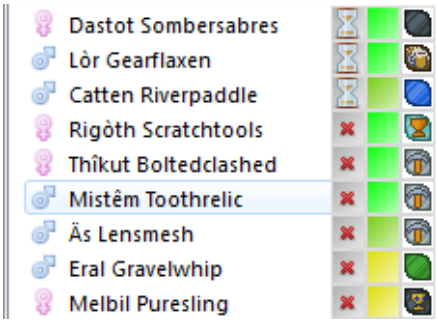
By clicking on these headers you can enable or disable a labor for an entire grouping. Since we don't want the new migrants idling, but haven't yet made facilities for most of them to use, let's do what we always do when a new migrant wave arrives: mass designate stuff for them to do, in bulk. Well, it just so happens that I've got a wall that I've been meaning to build, and there's quite a lot of fortress surface that needs to be smoothed out (and don't even get me started on the many pictures of cheese that we need, but lack!). So I click on the Masonry and Stone Detailing headers, toggle them on for the entire wave (you can also right-click on the headers), commit, and voila—stuff for them to do!

Now, these are just two of the most immediately useful scenarios for which grouping comes in handy, and there are quite a few more groupings that you can make and display. Additionally, if the correct option is enabled, these groups carry across all of the views, not just the current one. To see a demographic breakdown of your dwarves, group them by Age or Sex. To see which of your dwarves are Legendary, group them by Legendary Status (or hit Highest Skill for a more inclusive view). To check up on happiness, hit Happiness. To start working with Nicknames, hit Nicknames (this will prove useful in **"Assigning Nicknames"**, still ahead of us). To see what the chances of you getting a Legendary Armorsmith are, hit Highest Moodable Skill. To sort them by Military Status, click that, or Squad to check up on individual squads. To sort by Profession, hit profession. Use Collapse All and Expand All to switch between detail levels without having to manually toggle groups; for expedience you'll probably want to remember the associated `CTRL + <` and `CTRL + >` shortcuts.

Groups are a great tool for discerning demographic information about your fortress, which is why they work so well for spotting migrants—but as a sorting mechanism they're far from perfect. Dwarf Therapist therefore supplements grouping with another organization scheme, sorting—the topic of the very next section.

[16] Though it's generally reliable, when loading in dwarves from an auto-pause, the program may occassionally miss a couple. If you want to "play it safe", wait until the first few dwarves have made it onto your map.

6.3 Using Sorts



Let's now return to the problem of the six idling dwarves, and approach it with sorting in mind. When you click on one of the column headers at the top of a view, it will sort the content in ascending order against that column. The "Current Job" column is numerically sorted by the "Job ID", an internal list number assigned to that job. There's no particular order to how Job IDs are assigned because there's not truly superior logical way to organize them, but what's important to know is that idling is assigned a value of "-1". Sorting the column once will put idlers at the bottom, then sorting again will flip it around and bring them to the top—perfectly positioned for labor manipulation. Dwarves on break are given a value -2 and, conveniently enough, are also displayed—on top of idle ones.

Sorting by happiness will list your dwarves by their numerical happiness level, grading your dwarves down from ecstatic green to suicidal red—a far superior solution to the blunt and categorical Group equivalent.

The fourth column in your view is the "Profession" column, which works in a similar manner to the Current Job column, sorting by another arbitrary numerical system, the "Profession ID" list. The arbitrary nature of the sort, and the large number of professional icons, makes it much harder to recognize sorted professions from one another than grouped ones, so grouping is the clear winner when it comes to this particular task. The professional listing does have one useful function, though, in that it more immediately lists peasants at the top (or bottom) of the list.

Hovering over individual professions tells you how many dwarves have that labor enabled, and then clicking on it will sort your dwarves by their experience and skill in that category. This is much quicker and cleaner than performing the same operation with groups:

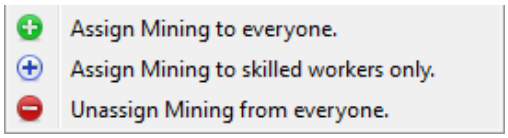
Anyone can pick plants, but only true farmers can plant seeds.

The ability to seamlessly list your dwarves by their competence at a task is one Dwarf Therapist's key sources of utility, and has many obvious applications when you need to find dwarves for a task you have in mind—like, say when building a marksdwarf squadron:

You can go even further with **"Filter Scripts"** and **"Roles"**, but those are advanced topics that we'll leave for later. If you right click on a column you can change the sort method—this is a more advanced role-based capacity, and will be discussed at length in the section **"Using Roles—The Sort Method"**.

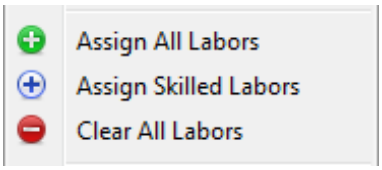
6.4 Mass Designations

In demonstrating the utility of grouping our use case was migrant wave designation, and in assigning our new dwarves things to do we made use of Dwarf Therapist's groupwise designation tool. By clicking on a group header you toggle a labor on for all legal dwarves in the contingent group; click on it again and you will toggle it off. This is one of Dwarf Therapist's most apparent mass designation tools—we will discuss these in detail in this section.



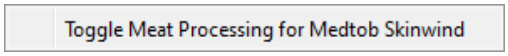
Groupwise designation is actually a subset of fortress-wide designation, which can be achieved with the labor headers' right click menu, shown at right (the other options have to do with columnar sorting and are covered in **"Using Roles—The Sort Method**"). Options one and three respectively toggle the labor on or off for *every* eligible dwarf in the fortress. The second option, meanwhile, is a smart sort: it allows you to assign the labor only to those dwarves skilled in it (skill level Novice or above), and it will disable it on dabblers.

The ability to designate bulk jobs thusly comes in handy in a number of different scenarios. In times of war you can quickly toggle off dangerous jobs like Hunting and Plant Gathering, for instance, and when you're finally getting around to dedicating a dwarf or a number of dwarves to a specific job you can quickly eliminate that labor from all other stragglers. Assigning every instance of a labor is not so immediately apparently useful but works well when combined with filter scripts, an advanced sort tool described in detail in **"Filter Scripts**". Skilled labor assignment, meanwhile, can be used to put those hunters and gatherers back to work after the danger has passed, or for reinstating jobs accidentally deleted by careless labor editing.



These three toggles comprise the laborwise mass designation tools and are complemented by similar dwarfwise ones shown at right, also accessible with a right click (the other options on the menu are covered at various other points in this guide). An option for assigning every labor is provided more for the sake of parallelism than anything else—there are hardly any situations where you want a dwarf working *every* job, and in specialized labor subset views labor group designation is handled in a more intuitive way by something else we're going to discuss shortly. Clearing all labors has the obvious utility of allowing you to clean a dwarf's slate, saving you a number of clicks when you're dedicating them to a labor. Finally, assigning all skilled labors does what it did in the laborwise menu but in reverse, and can be used to "de-dabble" or otherwise "reset" a worker.

It should be noted that all of these designation tools respect the bounds of the view: that is to say, they will not affect labors or workers that are not visible in the view. This behavior is useful if you are filtering your dwarves, if you have removed certain benign labors (like Cleaning) from the view, or if you are using a specialized custom labor subview. The triggers would better be named "Assign All Visible Labors" and "Assign Labor to all listed dwarves".



By right-clicking on any labor box in the view you can toggle on or off that entire labor tranche for the associated dwarf. This is an immense time-saver for those occasions when you have a dwarf running a gamut of jobs—disabling or enabling the different hauling subtasks, for instance, or enabling a gamut of tasks in a specialized labor subview (more intuitively suited for this tasks than the full "all labors" trigger).

A similar labor-wise operation occurs when you select a group of dwarves and then attempt to toggle a labor on or off on any one them—this will toggle that labor on or off for all of the dwarves you have selected, which can be a useful operation when you're using role sorting as it allows you to more easily set mass labor behaviors for large, but unfiltered, groups of dwarves.

6.5 Assigning Nicknames

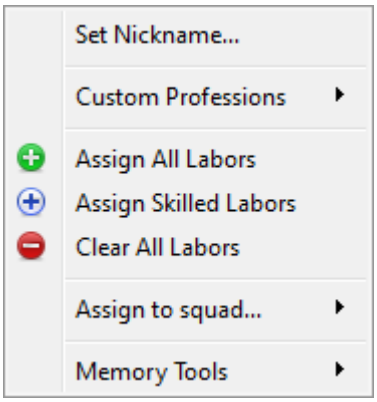
So you've spent a good ten minutes shifting around labors, building facilities, and generally getting your latest migratory wave to work at the various things that need work in your fortress. You've bootstrapped a metalworking industry, started making some potash, and are now weaving clothes. Feeling content with yourself, and maybe just a little tired because it's somehow two in the morning and you've been sitting here for five hours now, you save and log off so you can go get some sleep. In the morning you wake up, pour yourself some cereal, check the time (still Sunday, thank god), stretch your arms, and go right back to playing Dwarf Fortress. You open up Dwarf Fortress and...argh! What's this! Why are all these silly peasants making crappy armor while your legendary armorsmith is idling! Who told that farmer he could take over the cook's job! And most importantly, why is there still stone lying around everywhere!!!

So perhaps playing Dwarf Fortress until two in the morning isn't good for your fortress (never mind your sleep cycle). But there's another way to stay on top of the roles your dwarves are supposed to be playing, one with which you can be relatively sure that, if you come back in a week's time instead of a day's and have forgotten all of the various itty-bitty configuration details that the fortress survives on, you'll be able to (more) easily pick them up again and keep right on playing. The solution is to name your dwarves.

Dwarven nicknames are often used rather jestingly by players, since you can name *any* dwarf pretty much *anything*, even calling your King "Giant Poo Poo Head" and your Great Potash Maker "Unfortunate Accident". Dwarves don't know the difference and thus don't mind, but it's worth a cheap laugh from the player if "Giant Poo Poo Head" goes to clean up the blood stain left by the demise of "Unfortunate Accident". However, they can actually be a pretty powerful tool if used right. By nicknaming your dwarves by what their profession within your fortress is or will be, you'll be able to more easily keep track of who they are when you bump into them in the labor manager or on-screen. Their professional name might be "Woodworker", but to you they're "Furnace Operator", and using nicknames allows you to keep track of that while their professional name catches up to their new role.

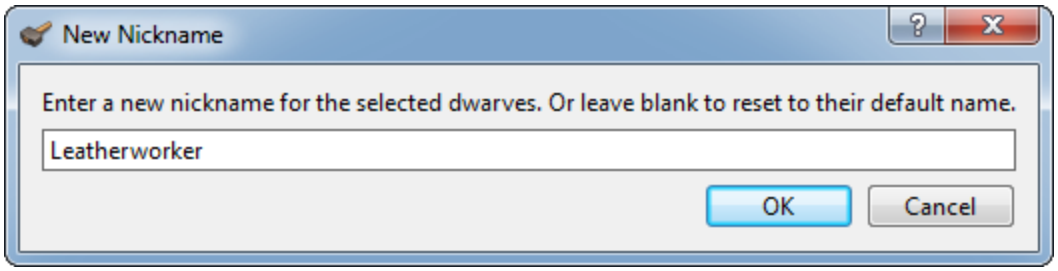
Let's look at one such fella for which a naming would be useful, a certain Medtob Swinwind.

Mebtob has a few assorted skills—he's an adequate Tanner and Fish Cleaner, and a Novice Fisherdwarf and Fish Dissector. However, none of these skills are really useful to me: I've got enough fisherdwarves and fish cleaners already,[17] tanning is only useful every once in a while, and fish dissection is a near completely worthless skill. What I *do* need, however, are some leatherworkers—I just bought a shipment from a caravan, and want to turn it into a complete set of backpacks, waterskins, and quivers for my military to peruse. Unfortunately the random number god has not blessed me with any professional leatherworks—which is fortunate for Mebtob, since he's now going to move past peasanthood to become the fortress leatherworker.

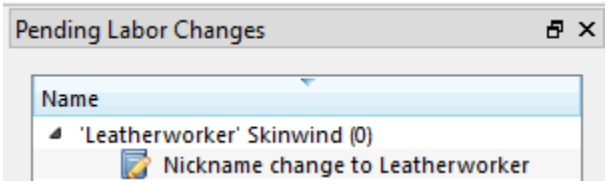


For now, though, he's still a regular old fish cleaner, and if you bump into him in the hallway or look at him in Dwarf Therapist after a week away or a really long night, you won't have a clue what he's there for. So to make that job easier, let's give him a nickname. Right click on Mebtob to bring up the same personalization menu we discussed a section earlier. For now we want "Set Nickname":

[17] Because of a bug, fish stocks do not replenish, which means that they will inevitably go bust, leaving your fishery workers with nothing to do.



New nicks are actually treated the same way as labor changes: once you've chosen a new nametag for your dwarf to go by and clicked on "OK", the name change will be added to the Pending Labor Changes dock, awaiting committal:



Ah yes, compatriot "Leatherworker Skinwind".

Commit the change, and you shall confuse the role this dwarf plays no longer.

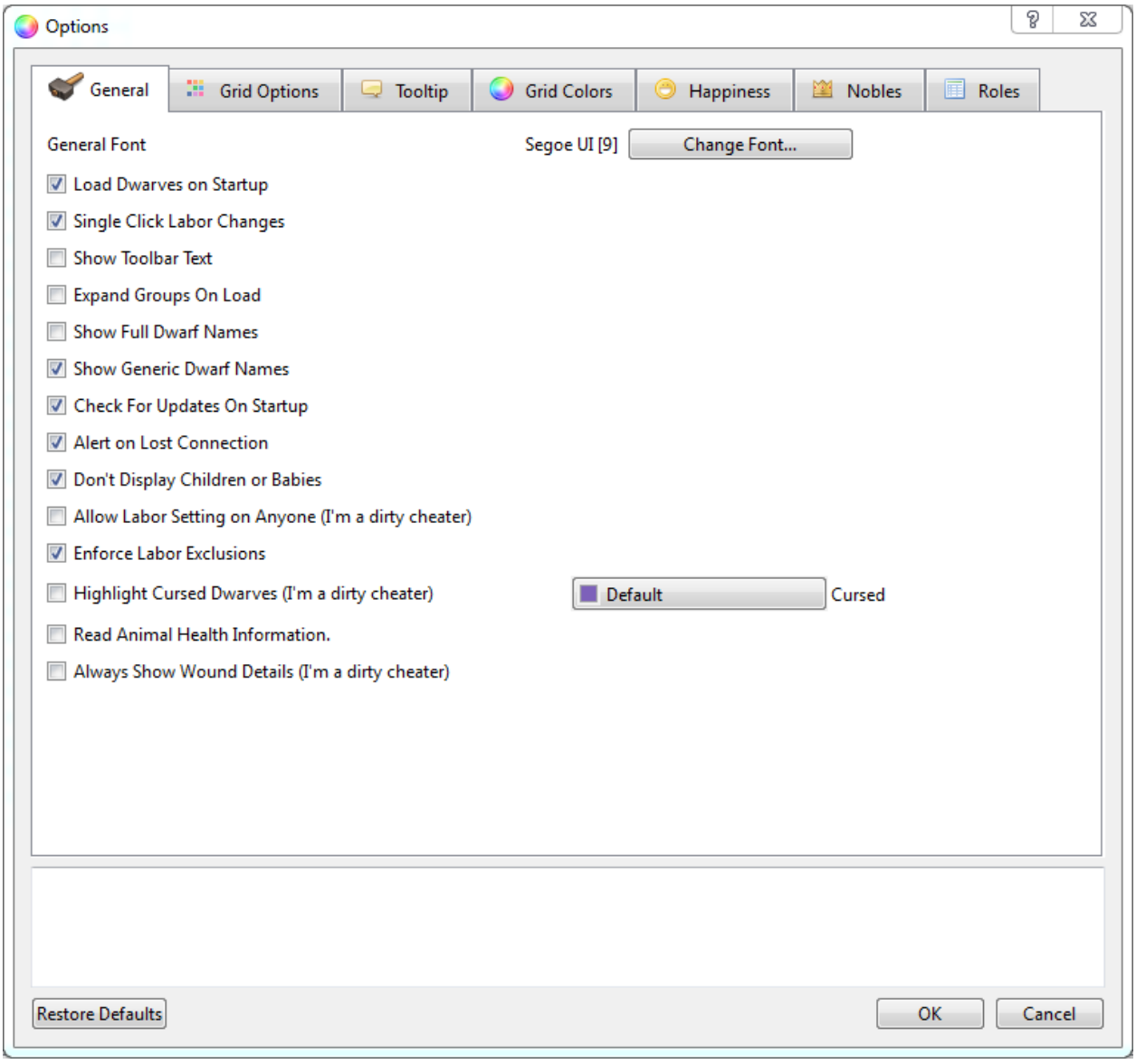
That concludes our discussion of Dwarf Therapist's basic labor management tools. We will cover many more advanced features in the **"Advanced Features**" section of this guide, but for now let's examine another aspect of the program: the options menu.

6.6 Addendum: Managing your Animals

While most of the views in Dwarf Therapist besides the labors view are non-interactive, two are. One is the Animals view, worth mentioning here; the second, the "Roles" view, is discussed in **"Using Roles—The View Method**". The Animals view provides information on the name (duh) and owner of the creature, their "profession" (really whether they are children or adults), their training level (nothing is displayed if they are tame), whether or not they are designated for or can be butchered, whether or not they are in a cage, and their physical attributes. I say that this menu is interactive, and it is: non-wild, non-pet creatures can be designated for butchering here. This allows it to replace the in-game Animal Status screen, provided that you don't try to tame any wildlife, as this cannot be done through Dwarf Therapist.

7 Options

The Options menu is available from a few different places: either a button on the main taskbar, through the "File" menu in the main menu, or with the `Ctrl + P` hotkey. This brings up a menu:



The options menu is extremely well-documented: if you're ever at a loss for what a particular checkbox or radio button does, hover over it and look for its description in the text box at the bottom of the dialogue. It's all quite intuitive and well-explained, so instead of wasting a ton of time and space describing it, I invite you to explore the menu, and then come back to here.

Good? If you're still interested in fiddling with the options, see the upcoming section. If not, skip ahead to the next part of this guide, **"Advanced Features"**.

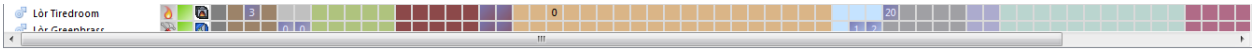
7.1 Formatting Your Display

A big problem I had with the default configuration of past versions of Dwarf Therapist is its affinity for gloss over informational density—non-functional fade-out boxes and headers and dividers that eat up tons of screen space were present, while several options that enhanced information display were not. More recent version of Dwarf Therapist have implemented some of the suggestions in this section by default, making some of these changes redundant, but this section is still provided to the reader as a reference.

My horizontal scroll bar at the beginning of this exercise.

Remove Spacers

To remove the spacers from the long-form Labor view, peruse the **Views**. Drop in the "Labor NO SPACERS" view from the menu and then delete the old one. Of course having "NO SPACERS" stare at us is quite annoying; we'll look at ways to fix this later in this guide.[18]

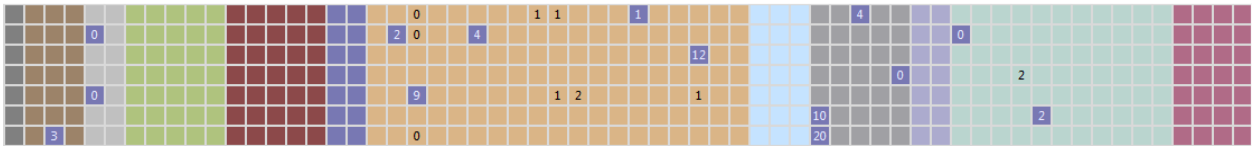


Turn off Gradient Shading on Headers

To remove the gradient shading in the column headers and return them to plain coloration, uncheck "Gradient Shade Column Headers" in `Options > Grid Options`.

Turn off Gradient Shading on Cells

To remove the gradient shading present on table cells that are toggled on, uncheck "Gradient Shade Cells" in `Options > Grid Options`.



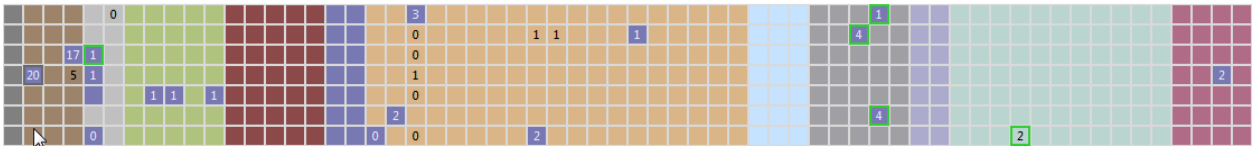
Synchronize Scrolling between Views

To enable this feature, check "Synchronize View Scroll Positions" in `Options > Grid Options`. This adds some functionality to your views, preserving the current scroll position between them and letting you examine a single dwarf (or if they're sorted the same way, a group of dwarves) through the lens of multiple different views. They don't have to be sorted the same way for this to work, though occasionally it near-misses (bringing you to the dwarf just above the one you care about in the view).

Highlight Highest Moodable Skill

[18] Note that as of version 20.6 Dwarf Therapist now ships with the very view solution first presented in this guide as an alternative option to the default: check the "Labors Alt" option.

To enable this feature, check "Highlight moodable cells in labor/skill columns." in `Options > Grid Options`. This one's optional: it gives you extra information, but knowing what moods your dwarves are likely to have isn't terribly useful since the selection is random, and you can get the information at a glance through a Group. Though it doesn't say it, this option also highlights dwarves that are legendary because of a mood with a different colored box. You can change the colors in `Options > Grid Colors`.



Moodable in green, already mooded in brown.

Show Highest Moodable Skill in Tooltip

To enable this feature, check "Show Highest Moodable Skill in Tooltip" in `Options > Tooltip`. This will add a "Highest Moodable Skill" entry to the dwarf tooltip—no real reason not to have it.

Make the Main Toolbar More Compact

To shrink the main toolbar a bit so that it doesn't take up so much vertical room (and thus give your view and your docks more of it), uncheck the "Show Toolbar Text" option in `Options > General`.

Highlight Nobles

To turn this feature on, hit "Highlight Nobles" in `Options > Nobles`. The default color is orange, and you can further pick specific colors for specific roles. Personally I set chief medical dwarves to dark red, bookkeepers, managers, mayors, and brokers to default, royals to magenta, and military types (militia leaders, champions) to dark green.

Role Information in Labor Columns

To turn this feature on, hit "Role Information in Labor Columns" in `Options >Roles`. We've barely talked about roles so far, and they're covered in-depth in the section on them, thoughtfully titled **"Roles"**. For now it's just more information for you to peruse.

Move, or Remove, your Docks

Docks are a very useful thing, displaying useful information in a compact form. However, if you want to make the most use of your space: go without. Removing all docks from the right side of the screen so that the edge of the view window is now plum against the right edge should be enough to let you see the entirety of the grid on a moderately large screen.

On my (21-inch) monitor, it was enough to get rid of the scroll bar completely.

If you want to get rid of the scroll bar but want to keep your docks, too, another option is to place them at the bottom. This is a dock-heavy option, however, because the docks are not optimized to use horizontal space well—so giving the Pending Labor Changes the entire lower fourth of the screen is no better than giving it the same amount of space, vertically, on the sidebar.

Remove the Main Toolbar

The main toolbar is very skinny: if, like me, you have space on the right edge (or can spare a sliver off the top), you can simply and safely stick it there. But if you want to reclaim that last ounce of screen space, by all means, remove it: all of its commands are hotkeyed anyway.

Play with Fonts, Spaces, and Font Sizes

If this still isn't enough to get rid of the horizontal scroll bar, and you really, really want to get rid of it, you can play around with the fonts, font sizes, spacer options, and grid sizes in `Options > Grid Options`, and lower the sizes of things until the bar is no more. Obviously, the smaller the font and grid size, the harder it is to read information of the utility—even reducing it from 16px to 15px has a noticeable effect.

Here is what my display looked like at the end of this exercise:

Cleaner, more informative, and most importantly: no horizontal scroll bar!

Part III
Advanced Features

In this section of the guide we're going to really dig into Dwarf Therapist, working with powerful elements of the program that aren't as immediately apparent as toggling labors on and off, giving stuff nicknames, and other such simple and obvious applications.

8 Roles

8.1 What's in a Role?

So far we've mentioned "roles" and the "role" they play in Dwarf Therapist only in passing. Since we're now going to discuss them in more detail, the first question we have to ask is, what's in a role? Have you ever had two miners work side-by-side from the very beginning of the game, but discovered that one reaches legendary status before the other? This happens when one dwarf is better adapted to that role than his fellow, and the differences between them become increasingly obvious over time. "Roles" is Dwarf Therapist-speak for the holistic weighing of the various elements of job performance, of which skill is only the most immediately visible and obvious element. Thus in order to understand what roles are, we must first get comfortable with what these elements are, and where they come from.

Attributes are, subjectively speaking, the most important hidden role modifier. No two dwarves are alike, and all dwarves have certain attributes that are attached to them from birth.[19] Where one dwarf might be naturally weak have superb spatial sense, another might lack analytical ability and be susceptible to disease, but be unnaturally strong. These attributes themselves fall into two categories, physical and mental; they can be assessed under the "Attributes" view, and they're described in detail on the DFWiki: `http://dwarffortresswiki.org/index.php/DF2014:Attributes`. Since they're pretty important for understanding roles, here's a quick list of the ones that affect job performance:[20]

Physical Attributes

Strength Alters the damage done in melee (increases velocity of weapon swings), increases muscle mass (thicker muscle layer also resists damage more), and increases how much a creature can carry. Higher strength also increases the speed with which a creature, even a naked creature, may move. Movement speed is important for pretty much every task, but to a varying degree.

Agility This attribute increases the speed at which a creature works in the same way as strength – a creature with maximum agility and strength can move around three times faster than a creature with minimum agility and strength.

Endurance Reduces the rate at which dwarves become exhausted, important for physically demanding tasks.

Toughness Reduces physical damage. Used by physically demanding tasks.

Mental Attributes

Analytical Ability

[19] Attributes, alongside appearance modifiers, are inherited through dwarven genetics.

[20] It should be noted that all creatures, not just dwarves, have attributes (for instance, the attributes of animals attached to your fortress are visible on the "Animals" view). The attributes of creatures that are not tied to your fortress—wildlife, unwelcome visitors, hostile sapient creatures, caravan traders and guards—will be hidden from you.

Focus

Willpower Willpower directly reduces exertion and pain effects, useful for physically demanding tasks.

Creativity

Intuition

Patience

Memory

Linguistic Ability

Spatial Sense

Kinesthetic Sense Most skills involving any movement at all (lots of them), and many non-skilled tasks as well are affected by Kinesthetic Sense.

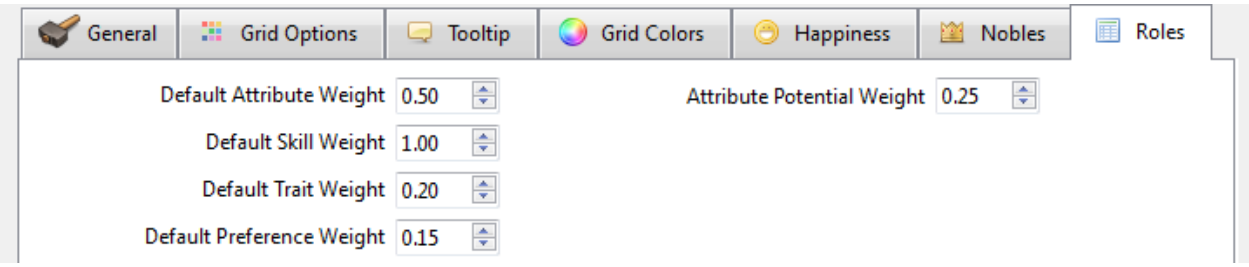
Social Awareness

Physical attributes will increase or decrease over time, depending on whether a dwarf uses or doesn't use them in their day to day tasks. Thus your Miner will become very tough and very strong while working on the job, and would make a good recruit for your military in their next, ahem, role.

Another modifier is a dwarf's **personality traits**. For the most part personality traits only affect social skills and appointed jobs that involve working with others - expeditions leaders, managers, brokers, and mayors use them, as do high nobles. There is one, perseverance, that is thought to affect the length of breaks that your dwarves will take, and might thus be important for all skills—your dwarves will obviously do less work overall if they're always on break. However, Toady has never confirmed this.

The final hidden element of a dwarf's role is his or her **preferences**. Dwarves have innate preferences for certain items, materials, organisms, and even colors and shapes (I want my coffin to be a *yellow square*, you hear me!). Dwarves like seeing things they like—they'll get a happy thought from it—and they like working with them even more, producing above-average quality goods when working on items or with materials that they like. For this reason a dwarf that likes beds will make a better carpenter than a dwarf that like breastplates and vice versa. Having the right sort of preferences can be an important bonus in a dwarf's work, meriting weight in the role calculations.

Now that we've examined all of the elements besides skill that are weighed into roles, the next logical question is: how are role numbers calculated? As it turns out, this is not a trivial question. There are, essentially, three ways of "thinking about"—and hence using—roles. Let's first examine th default behavior, which can be seen and modified in the "Roles" Options menu (`Options > Roles`):



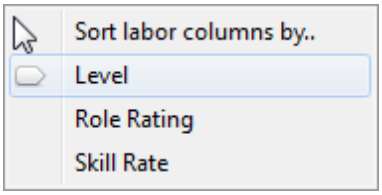
Dwarf Therapist takes a dwarf's attributes, skills, traits, and preferences and weighs the ones that matter for a certain labor by the amounts inputted here. It then performs a **cumulative distribution function** on the results, giving you how fit that dwarf is for that role as a percentage calculated against the *current dwarves in your fortress*. The result of this statistical trickery is that while the result is a *current* rating, it's *non-transferable* (a 75% rating in one skill is not directly comparable to a 75% rating in another) and *non-preservable* (role ratings will resettle every migrant wave, or every time a child grows up). For the purposes of this guide, I call this rating **skill rank**.

Changing the second option in `Options > Roles`, "Default Skill Weight", to 0 removes it from the equation. With skills no longer counting for anything, the role rating now shows what I refer to as **basal compatibility**—the results of a CDF crunch of your dwarves' attributes, traits, and preferences alone. This is a useful view of your fortress "in retrospect", as you might discover that the weaponsmith you appointed from scratch in wave one is completely outclassed by several dwarves in waves two, three, and four. Of course by that point that dwarf would have put on so much distance in terms of skill that it doesn't matter anymore—but it's still an interesting statistic to know. It's also much less statistically sharp than skill rank is, because base stats don't vary nearly as much as skill does.

The last and most useful function that roles serve is one that answers the question "Which of these dwarves will reach legendary status the quickest?" In such a distribution an unskilled dwarf with minimum stats will be rated at zero percent, an accomplished one with middling stats would be a fifty, and that legendary +5 dwarf with maximum stats and perfect preferences and whatnot would be a one hundred: a **true role rating**. So, how do you turn this wonderful ranking on?

Well... you can't. It's a pipe dream. There are simply too many variables involved in job completion length and skills gain and no one's ever fully done anything beyond rudimentary research on the topic - it's very complicated and not nearly as glamorous as combat weapon penetration rates. Even the weights that the program uses are the result of conjecture—there's just not enough !!SCIENCE!! to base the whole thing on as of now, and that's the reason that we have to use skill rank, drawbacks that it has, as a substitute.

8.2 Using Roles—The Sort Method



There are two distinct ways to go about applying role ratings, one involving sorting, one involving a different view. I will describe them in order of preference—sorting settings first, the "Roles" view second.

We've talked before about the utility of clicking on the labor headers and having your dwarves sorted in ascending order of experience. But did you know you can actually change this behavior? Indeed, right-clicking on anywhere on the labor headers will bring up a menu that allows you to change the current labor sorting behavior, as seen on the right.[21]

The first option, Level, is the default option, and that makes sense. The third option is pretty much the same as the first, except that skill rate (which the amount of skill gained every time a labor in that category is completed) is modified by, you guessed it, the dwarf's role, and so will vary a little from straight up experience level—but experience is still the most important indicator of relative skill gain, so it won't change too much. However, the one we want right now is Role Rating. Click on it. Now, whenever you sort a column, the dwarves will be listed by their adeptness for that labor. Assuming you turned the role tooltip display on, as we did in **"Formatting Your Display"**, then you can hover over a labor box to see the exactness of the match—if you skipped that section, you can toggle the behavior on now by going to `Options > Roles > Show role information in labor columns`.

If you play around with sorting the columns now, you will notice two things. The first is that dwarves with the labor enabled and those with it disabled are considered, and listed, separately from one another: under the ascending sort, dwarves active with that job come first, followed by those that are not. The second

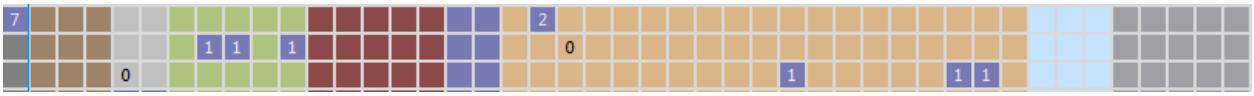
[21] You can also change the sorting behavior of the dwarf column, to sort by ID (a somewhat useful alternative to grouping by migrant wave) and age (useless). Unfortunately, it will not save this behavior, and attempting to reverse the sort will send it right back into alphabetical order.

is that in terms of basal compatibility skill is (mostly) irrelevant; beyond the fact that we took it out of the calculations in the previous section, this indicates that physical attribute gain from performing labors that use that attribute is simply not that high. And so it may be that your primary mason is buried nearer to the bottom of the list, with a compatibility of 14%, with a long list of mostly dabbling dwarves that outrank him:

In this case the reason that the dwarf that became my chief mason was so incompatible with his job is that he was part of my starting seven, and so his attributes were random—and the random number god did not favor me in this case. It's important, however, to realize when basal compatibility is important and when they are not. While basal compatibility will tell you which of two comparable dwarves would be better at a certain job, they are no replacement for hard-won experience, and so that dwarf, incompatible though he may be, is many times better than any of the laymen that pretend to also do his job. Once you put three or four levels of experience points between two dwarves, their roles lose all relevance.

So then, when are roles important? As it so happens, my fortress just experienced a migratory wave, and something that my fortress critically lacks right now is metalworkers. I'm a big believer in expensive, well-decorated furniture for my dwarves, and I've got a skilled gem setter running around encrusting beds in locally-mined sapphire, but he's not keeping up with the demand. I have a lot of extra fuel, some gold bars, and a couple of metalsmith's forges idling around, so I decide that the solution to my problem is to put two of these new migrants to work as dedicated metalcrafters, studding every piece of jewelry they can get their hands on in gold. Since no one has a skill advantage in this arena (my fortress has zero metalcrafters), and all but two of my dwarves are pretty much useless anyway, I want to pick out the best two dwarves available from this wave. How do I go about doing it? By combining two things we've learned so far, grouping and sorting, with a third—roles.

Try doing this exercise yourself—you need not even have a fresh migrant wave. First, group your dwarves by migration wave, collapse them, and open the latest wave. Now, with the sorting method set appropriately, hit "Metalcrafting" to sort these dwarves by role score. Now look down your list.



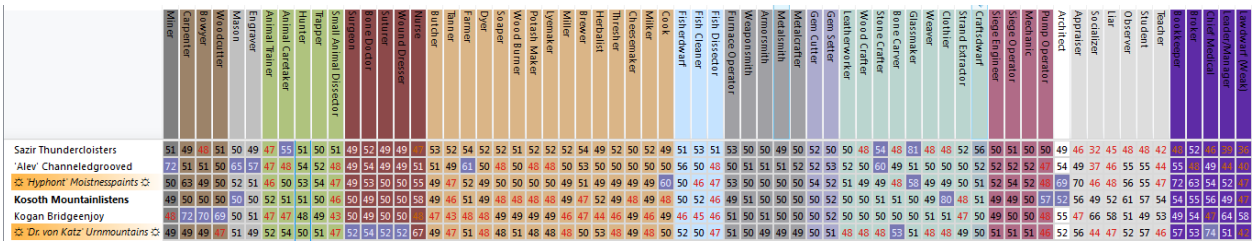
In my case, the first dwarf on the list was an Adept miner with a score of 98.1 percent; but mining is a useful skill and I'd rather he cut rock for the fortress, so I keep going down. The next option is better: a ranger whose only real usable skill is hunting, and a farmer with some assorted non-essential skills, both of whom are easily replaceable. I right click on their names and hit "Clear all Labors" to quickly wipe their workloads, designate metalcrafting for the pair, and then hit "Commit" to send the changes to the game. I even give them nicknames, to be extra sure I won't forget about them:

Notice the change is sorting behavior to reflect changes in labor designation.

And voila—we are done. Now we take a quick look at how this problem can be approached using the "Roles" view.

8.3 Using Roles—The View Method

Another way to tweak your dwarves using roles is to use the "Roles" view.



This is one of the secondary views that is open by default when you first install the program. The difference here (besides the fact that this view uses the old labor organization system) is that instead of displaying dwarves' labor preferences, this view displays their role ratings, allowing you to manipulate their labor preferences based on role without having to change your sorting settings. This has the advantage of not having you to mess with your sorting settings, but the disadvantage of having to switch to another view.

Other than the difference in the up-frontness of the information, using the view method to make role-informed labor changes isn't all too different from using the sort method—group up your migrants, click on the column to sort the role, then pick an acceptable candidate from the bunch. Overall, I prefer dealing with sort settings to dealing with another view, so in my games I use the sort method—but you are free to chose whichever appeals to you more.

In either case, our end result is that we have now committed two well-suited dwarves to their new tasks *almost* flawlessly. But there are other, similarly replaceable dwarves also in the fortress that would make better candidates for this job but aren't in this particular migratory wave, but hunting them down is a pain. I could find the best-suited dwarves in the *fortress* by turning off grouping and then sorting the column, but then I'd bump into another problem: which dwarves are replaceable, and which ones am I training up or holding onto with certain roles in mind? In this respect, your tools are crude—*maybe* you remember exactly or can deduce from the labor settings what role each dwarf is set for, but in a fortress of 200, you probably don't. In large fortresses with many industries, it's simply not possible to easily keep track of so many variables at once.

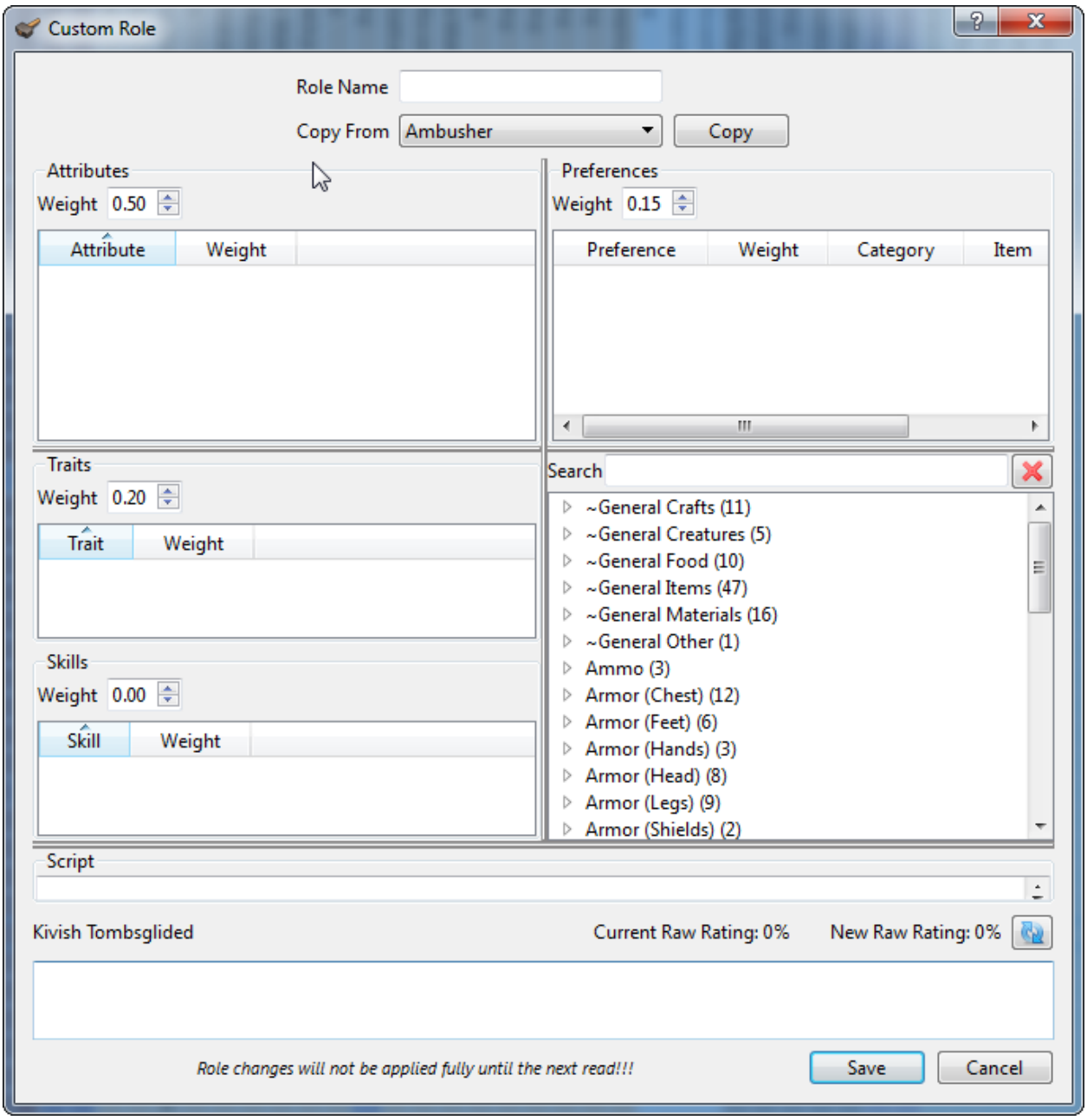
We can solve this problem by using nicknames aggressively, designating all dwarves committed to a task with a nick, and then using the "Has Nickname" grouping in the view. Setting so many nicknames is tedious, however, and if you don't like using them then you're out of luck. Or are you? There is another, more powerful solution that will come later in this guide: filter scripts. For more details on this, see **"Filter Scripts"** for the scoop.

Assigning jobs based on role ratings is fine and all, but what if there was something you could do that would allow you to do this automatically? **"Optimization Plans"**, which we'll discuss much later in this guide, do just that.

As mentioned in this section, any role which has skilled labors associated with it will automatically allow you to toggle those labors through the role's role rating column, and you can toggle multiple labors this way. This capacity often comes in handy when doing what we will be doing in the next section of this guide, defining our own grid views. See **"Custom Grid Views"** for more.

8.4 Creating Custom Roles

If you right click on "Roles" on the menu bar it will bring up a menu with several role-modification related entries on it. Dwarf Therapist allows the creation of custom roles through this dialogue, and you can also export and import other player's custom roles definitions. If you don't like a default role, you can overwrite it by building and saving a custom role with the same name.[22] Click on "New Custom Role" and it should bring up this dialogue:



[22] You can also do this by exiting Dwarf Therapist and browsing to and modifying the `game_data.ini` in the program's install directory: see **"Modifying Game Data"** for more information. A word of warning: your changes will not be preserved should you update Dwarf Therapist.

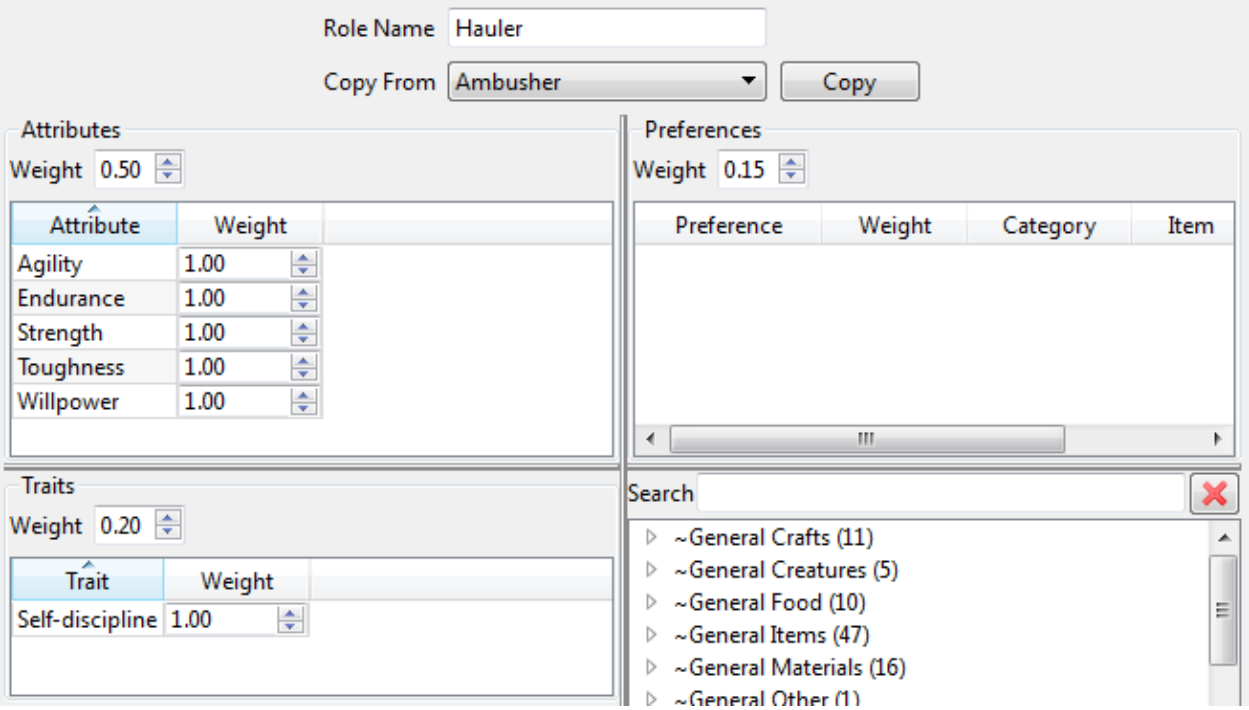
This is the editing interface for creating a custom role, and clearly demarcates the four components of a role. There is a scripting option available—this is a plug-in for **"Filter Scripts**" that we'll talk about later. And finally, the italic text at the bottom of the window tells us that roles changes will not be read in until you reread your dwarves, so we will have to do so after we're done here.

Dwarf Therapist ships with a pretty comprehensive role library—it even has lawdwarf (weak) and liar options, and provides role information for jobs that are not implemented into the game, such as alchemy. However, there is one role definition that it lacks, and that is a role setting for haulers. Ye peasants do their job best when they're quick and strong, but there's no role for such a thing available! The solution, of course, is to write our own.

Start by copying role settings from a similarly physically demanding job—say, mining. Scroll down to mining in the "Copy From" menu (or hit M while the menu is active to get there more quickly) and click "Copy". This will copy all of the role settings for minters into the dialogue. Our haulers need not be lovers of picks, so let's remove it from the Preferences screen—right click on it and hit "Remove Selected". Skills are irrelevant, too (especially for an unskilled hauler), so remove that as well. Actually, for a hauler that's going to be carrying pretty much everything in the fortress back and forth, preferences are unimportant—they'll bump into pretty much everything—so let's drop stone, too.

Hauling is an unskilled job, so the only things that matter for it is the speed and endurance of the dwarf. That means that the Strength, Endurance, Willpower, Agility, and Toughness attributes are at a premium, and the rest can be gotten rid of. The only Trait that matters to use is self-discipline—don't want them taking two-season breaks, after all—so let's add that into the mix, too. And, of course, let's give your new role a name: "Hauler" seems appropriate.

This is what the important settings in the interface should look like at the end of our little exercise:



Hit "Save" to save your new custom role. Now, whenever you go to the Custom Roles dialogue box, hovering over "Edit Custom Role" or "Delete Custom Role" will give you the option to perform that action on your new role. Custom roles can be used in custom views and in labor optimization—we'll see an application for them later—but cannot yet be bound to custom professions or to labors.

8.5 Exporting and Importing Custom Roles

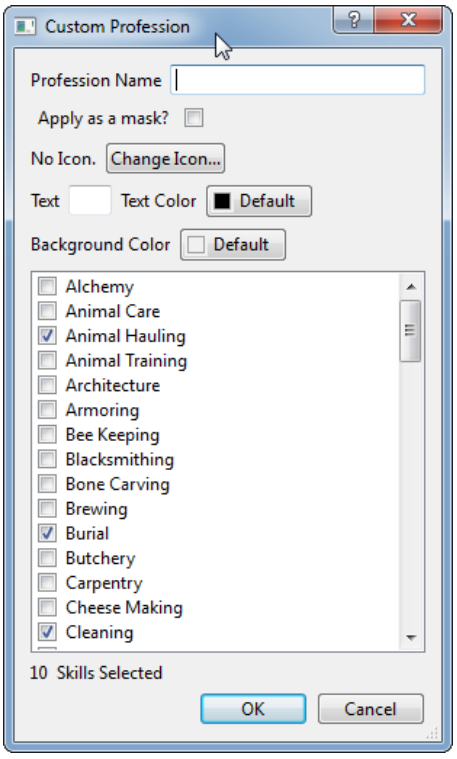
It's also possible to export custom roles, which creates a Dwarf Therapist export file (`.dtp`) that can saved and then passed along to another installation of the utility by importing it. You can export your custom roles and then upload them on the web (preferably the Dwarf Fortress File Depot: `http://www.dffd.wimbli.com/`) to share them with other players, or you can download one from the web and then import them into Dwarf Therapist so that you can use them too.

9 Custom Professions

Dwarf Fortress has a *lot* of professions, and even more skills, available to your dwarves. In fact, learning what each profession and skill corresponds to is one of the hardest part of learning to play the game, because there's just so many of them. You can add to this sprawl by creating your own professions, assigning multiple labors to one unified profession. This ability has its uses, and in this section we're going to use it to unify hauling labors.

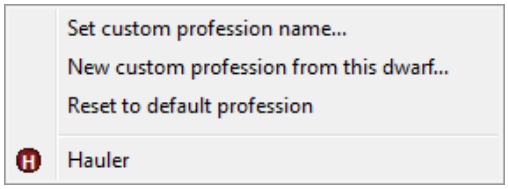
Whether your dwarf is hauling around sacks or focused on their primary task is usually an all-or-nothing thing: either they're committed to their job, or they're not. It's not very useful to have dwarves only perform *certain* hauling tasks, unless you're getting into the extreme end of fortress management and optimization, so most players of the game have them either all on or all off on a dwarf-by-dwarf basis. We're also going to assign the "Hauler" role that we built in the previous section, **"Creating Custom Roles"**, to this new, unified profession.

9.1 Creating Custom Professions



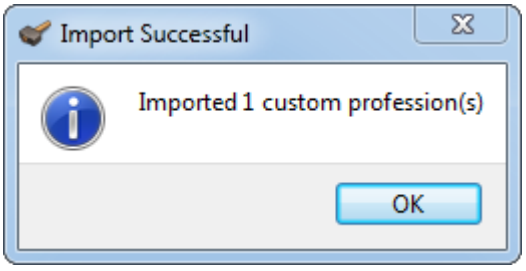
The dialogue for creating custom professions is located in one of two places, and you can get there either by hitting "Create Custom Profession" at the bottom of the Custom Professions dock, or by right clicking on a dwarf, going to "Custom Professions", and hitting "New custom profession from this dwarf". This second method starts you off with the labors that that dwarf had enabled checked, and so is faster if you have a dwarf already set to the labors you want—and after a quick profession sort I discover that I do, in fact, have a peasant hanging around my fortress, so I open it up off of him. Lo and behold, the ten hauling "subskills" are already selected. I name the profession "Hauler" and give it a red circle icon, one of the spare ones in the utility's default set that's not already used by a professions. To make it clearer that this icon is for haulers, I'm going to use the text and text coloration option provided in the window to draw a white H over my icon. You can also add a background color, but the regular icon set keeps a transparent white background, so I will too. I hit ok and the profession is now listed under "Custom Professions" in the Custom Professions and Icons dock. To make it appear in the display, you have to commit your changes and reload your dwarves.

To work the way we intended, make sure you don't check the Mask option in the window—this will change the behavior so that the custom profession only masks the dwarf's ordinary profession, and it will not allow you to make designation changes. You can remove a dwarf's custom profession designation with "Reset to default profession" and then a commit to the game.



You can create a mask more directly by right clicking on the dwarf and then going to "Set custom profession name" under the custom professions menu, and then inputting a name: once committed this will change the dwarf's profession to a custom one. This is a by-dwarf operation that basically mirrors how custom professions work within the game, replacing the dwarf's professional name with the new string but not changing anything else, without labor assignments or a custom icon, and with no facilities for transferring the profession to other dwarves. Thus it's like a nickname applied to the dwarf's profession, and in fact provides the same "who's this dwarf?" functionality that we previously used to make nicknames useful. However, since nicknames can be more easily seen at a glance within the Dwarf Therapist utility (and don't get in the way of this feature's more advanced version), I recommend sticking with them for this function. For more on custom professions, in particular a part of their utility that we're not yet ready to cover here, see **"Super Labors"**.

9.2 Exporting and Importing Professions



Binmaker extrordinare.

Custom professions is actually one of the two Dwarf Therapist features we discuss (alongside nicknames) that are present within the base game, although custom professions have less utility within the game—they simply replace the dwarf's professional name. If you want to assign the same profession to multiple dwarves you have to do so manually, retyping it in each time. If you assign a custom profession to a dwarf within the game, but don't import it, his professional name will change in Dwarf Therapist but nothing else will (essentially the same as setting a mask). To make the profession more available to Dwarf Therapist, allowing you to more easily assign it to multiple dwarves, give it an icon, and use it as a labor designation shortcut, you have to import it. To do so, hit `File > Import Professions from DF`—it'll give you a quick confirmation window telling you how many professions you've imported.

Much as with roles, custom professions can be made within the utility and exported, or taken from someone else and imported—this is actually going to be a common theme between the various customizable functions we're discussing in this section of the guide. There are even dialogues that let you pick and choose which professions you want to export or import. Both options are available from the `File` menu.

10 Addendum: Custom Icons

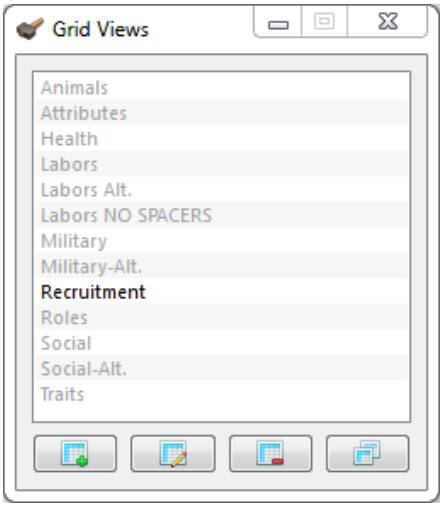
If for some reason you do not like the default professional icon associated with any particular profession, you can change it to whatever icon you like by right clicking on the it and hitting "Customize". You will be brought to a "Custom Icon" window very similar to the "Custom Profession" window, but with the profession name grayed out and the labor toggles not present (since you're only dealing in iconography). Any edited professional icons you use will be recognized by the program as custom icons, and presented as such in the "Customizations" dock, where you can edit or delete them. Note that custom professions are treated by the program as something rather more comprehensive than just a custom icon, and will show up in this dock as "Custom Professions"—the icons you create for them will not be listed separately.

11 Custom Grid Views

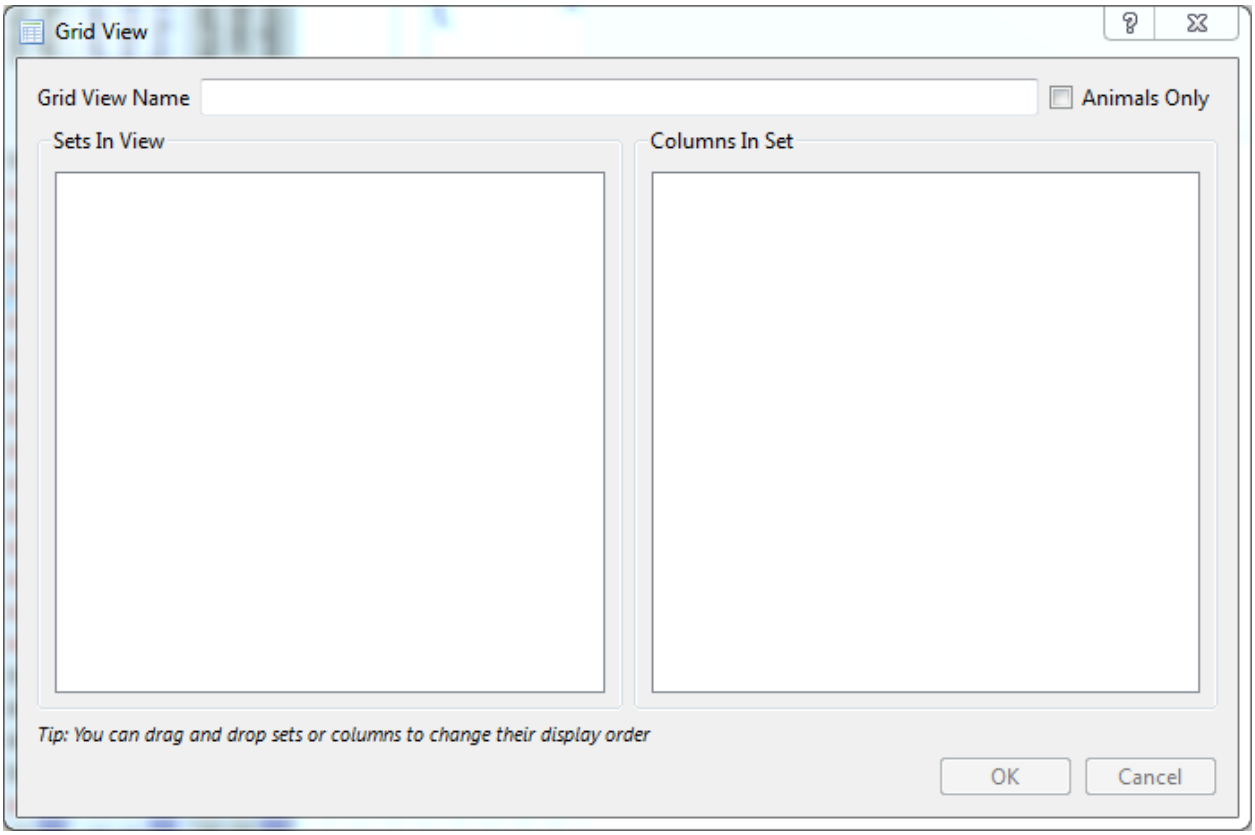
Probably the most important immediate consequence of the writing of this guide was the introduction of the improved "Labors" view as the default view in Dwarf Therapist. This view was built over the course of this section, using Dwarf Therapist's custom grid view capacity. The way it was built, and the thought process behind the changes, is presented here.

Unlike the rest of the advanced utilities we're discussing in this section of the guide, custom grid views can only be created and edited through the associated dock, so if you don't have it open already do so at least for the duration of your editing.

Inside the dock you will find the grid views that the utility comes pre-loaded with, but they will be grayed out. You can create a new, editable grid view in one of two ways: either by hitting "Add New Grid View", which gives you a blank, or by right clicking on and copying one of the views that is already hardcoded in, which will generate you an editable copy of the view.[23] At right you can see what the grid views dock looks like with one custom view, "Recruitment", already defined.

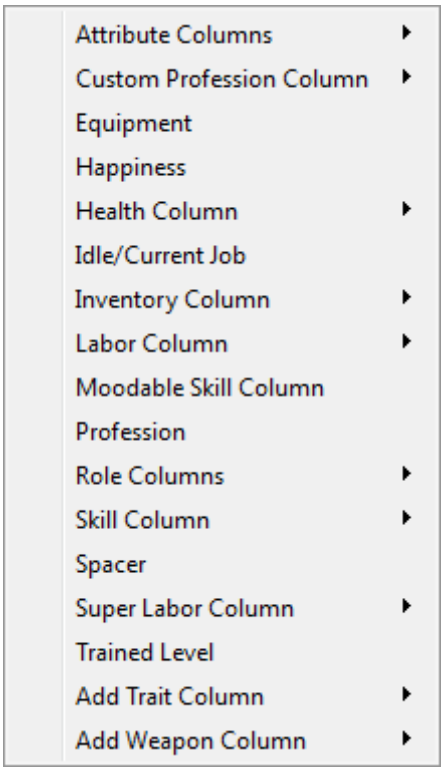


Try hitting the "Add a new grid view" button and you will be brought to an empty grid view creation dialogue:



[23] Note that the grid views that come hard-coded with the utility cannot be deleted.

The grid view creation dialogue organizes its columns into "sets", which are organizatory... sets... of columns of one color. If you try to create grid view columns without sets to place them in, Dwarf Therapist will complain to you. You can set the name and background color of a set, the latter of which is made the default background color for all columns in the set. Also note that you can make animal-specific views, like the "Animals" view packaged with the program by default. The main feature, however, is the individual columns themselves.



Attributes This is where you will find the attribute columns used in the default "Attribute" view.

Custom Professions This option allows you to display labor toggles for the super-labors associated with these professions (see the next section, **"Super Labors**").

Custom Roles This option allows you to display role ratings for custom roles you've defined, exactly like you can with regular, predefined roles.

Equipment A special "Equipment" column present by default in labor views.

Happiness A special "Happiness" column present by default in the labor views.

Health This is where you will find the health information columns used in the default "Health" view.

Idle/Current Job A special "Current Job" column present by default in the labor views.

Inventory This is where you will find the military inventory information columns used in the default "Military" view, not including weapons, listed seperately.

Labors This is where you will find the labor setting columns that form the bulk of the default labor views—the core of the program.

Moodable Skill A special "Moodable Skill" column that presents each dwarf's moodable skill, an alternative way of displaying this information that contrasts with the "Display Moodable Skills" option covered in **"Options**". Not enabled by default in any view, but you can add it in yourself if you'd like.

Professions A special "Profession" column present by default in the labor views.

Roles This is where you will find the pre-defined role rating columns used in the "Roles" view.

Skills In cases where skills match labors one-to-one, skill columns are inferior to labor columns because the labor columns display the skill *and* allow you to toggle the labor, which skill columns can't do. There are a *lot* more skills than there are associated labors, though, so if you want to display skills ranging in implementation from "Military Tactitian" and "Poet" to "Armor User" and "Teacher", you go here.

Spacer This option adds a simple spacer. You can adjust the width of the spacer with the right click

menu—the default is 4 pixels.

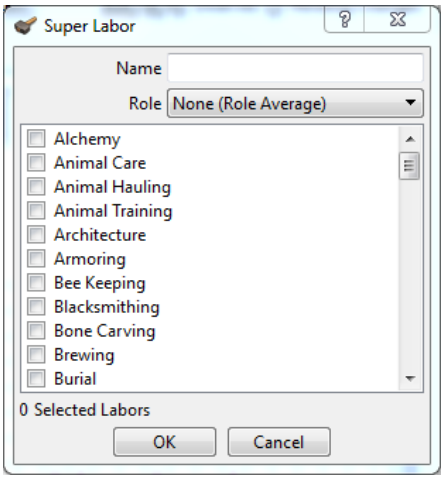
Super Labor Column Super labors are a subset of what a custom profession. We will discuss super labors in depth in the very next section, **"Super Labors"**.

Trained This option only works properly if you toggle "Display Animals" on. It lists the training level of the animals in your view, as seen in the default "Animals" view.

Traits Traits are like attributes, but while attributes are physical, traits are mental. These columns are used in the default "Traits" view.

Weapons Weapon columns tell you whether or not the dwarf can wield the weapon in question. Because of a bug, variety in the types of weapons dwarves can wield based on their size is not present, because Dwarf Fortress checks against the racial average instead of against the individual dwarf. For this reason dwarves will either all be able to or all be unable to wield a weapon of choice, which to a large extent limits the usefulness of these columnular options.

11.1 Super Labors



Super labors are a recent addition to Dwarf Therapist that allow you to define your own togglable labor columns out of multiple pre-existing labors. The primary method for creating super labors is to hit the "Super Labor" option on the Customizations dock, which brings you to dialogue displayed at right. Super labors are in reality a subset of a custom professions—in fact, you can't even name a super labor something that you have already named a custom profession, or vice versa, as it will cause Dwarf Therapist to complain. Give the super labor a unique name, associate it with a role (or don't, in which case a hidden role will be generated and associated with the super labor that uses the average of the chosen labor's role ratings), and then select the labors that you want to be included in the role. Once you're satisfied, hit "OK" and your new super labor will appear in the Customizations dock as a new editable (and deletable) item.

A second way to define super labors is to do so using the dwarfwise menu, a procedure that almost exactly mirrors that of defining a dwarfwise custom profession—click on a dwarf and go to `Customization > New super labor from this unit`, and you will be presented with the same dialogue, this time with the labors that the dwarf currently has enabled, including pending changes, already filled out.

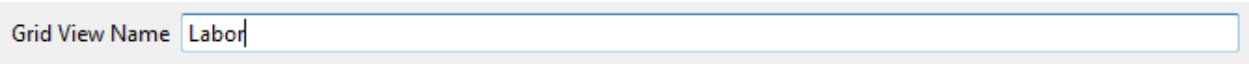
The primary purpose of the super labor is that it allows you to bind together several labors into one toggle, allowing you to, for instance, unify all of the hauling subtasks, to save on space and sprawl. Once you have defined a super labor, it will appear in the "Grid Views" custom view definition dialogue as a new item under the "Super Labors" menu. A color gradient is used to provide information as to the number of subtasks enabled: if none are enabled, the box is unfilled; if at least one is enabled, it is lightly colored; if more, more darkly colored; and if all tasks are enabled, the box is completely filled out.

In reality, the only thing differenciating a super labor from a custom profession is the lack of an assigned icon.[24] Indeed, custom professions implement super labors in the background, allowing you to create custom professional multi-labor toggles through the "Custom Professions" item; custom roles also implement them for associated skilled labors, a behavior that can easily be seen in the "Roles" view. Most of the time, you'll want to be implementing custom professions instead, but you can always create explicit super labors instead you want to cut on cruft. See the addendum at the end of the next section for an example usage.

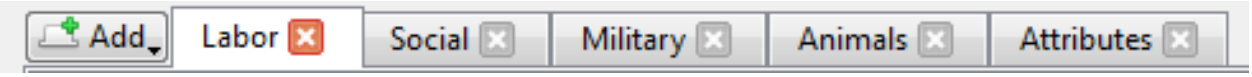
[24] See also **"Addendum: Custom Icons"**.

11.2 Creating Your Own Grid Views

Copy the Labors NO SPACERS view now, then right click on it and hit "Edit". The very first thing you should do is this:



Now if you add that view from the "Add Views" drop-down menu and delete the old one:



NO SPACERS, banished!

The Grid View window is organized into two columns, sets on the left and component columns on the right. Set names are not displayed anywhere on-screen, so they're mostly organizational, but ordering your columns causes the program to automatically apply the set's chosen coloration to all columns in the set. One column in the game is immutable—your dwarves by default, or your animals if you've copied the animal view instead. This will always appear on the left edge, and does not appear in this listing.

Right clicking on a set allows you to either modify it or delete it entirely. Editing the set allows you to change its name (again, merely organizational) and its coloration—there are a number of predefined options, but by going to the `[...]` option you can choose and use any hex value.[25] Clicking on an empty space in the box creates a new, empty set for editing. To rearrange the position of a set, simply grab and tug it up or down.

The columns themselves are color-codes to match their sets, but if you edit them you'll be able to override the base set color and set your own. Right clicking anywhere will also bring up a complete menu list of possible columns to add to your view. You can also add or remove spacers here—since they don't serve too great a function, if you don't have the horizontal sceen space for them in a view, removing them might be extremely helpful.

Now, let's make some modifications to our new and improved "Labor" view.

Our Labor View at the beginning of this exercise.

The first thing we should do is remove alchemy. Assuming you're not using mods, it's not implemented into the game, and so it has no place in the labor view. Go to Other Jobs, right-click on Alchemy, and hit Remove.

There isn't ever a real reason to remove Cleaning as an enabled labor, either—when your dwarves actually perform that job, it's a blessing—so let's remove that too. This has the benefit of allowing you to remove all labors from your dwarf with the right click option without removing cleaning as well.

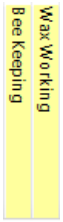
Though Architecture is held in-game to be an administrative job, despite having a labor assigned to it, it's really an engineering one. Now that it's left all on its lonesome on the right edge of our screen, we have an excuse to move it under the engineering banner. I'm placing it between mechanics and pump operating on the banner.

[25] For some reason choosing a new color sometimes doesn't change the color of the header. Going through the menus and just pressing "OK" again fixes this bug.

Animal care is similarly unimplemented in vanilla at the moment—your animals either heal up, or they die, and there's nothing you can do about it. So it's safe to send it the same way as alchemy, because even if some of your dwarves do have skill in it they'll never get to use it.

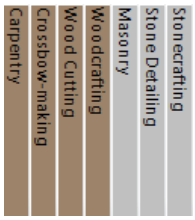
Feeding prisoners and the wounded is always a priority job that is or should be enabled on all dwarves by default, pretty much even the grumbly ones—the rare -20 happiness penalty is minor compared to the cost of a tantrum spiral. So these two columns are safe to remove, too.

Now that we've removed useless labors from the display, let's do some organization amongst the tasks that are left. Farming in particular is a mightily large category, and I often get lost looking for my Weaver somewhere between my Potash Maker and my Presser, or even start designating the wrong labors on a dwarf! I have a similar problem with the labors under the "Crafts" header. Let's divide these sections between a few different categories.



The first new category I create is beekeeping. Beekeeping is rarely used by players because it's an extremely labor-intensive and limited form of food production that produces low-value goods and is heavily bugged. Assuming the bugs with the industry are resolved, it might become more useful in future versions of the game, but for now we'll relegate it to the sideline. Beekeeping and Wax Working are both jobs that are only ever used in this industry. The new color of choice is obvious—yellow. Open up the customization menu and select the weaker yellow of the two that are available in the menu. This is still pretty bright, though, so let's weaken the colors a teeny bit further. In the end the color I used had an RGB value of 255-255-157 (alpha 255), but you can adjust it to your liking.

Woodcrafting is better off alongside its peers in the woodworking column.

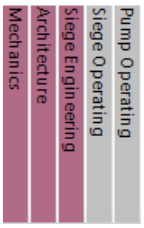


In a similar vein, stonecrafting is better alongside masonry and stone detailing.

Pump operating and siege engineering fit a certain theme, so while we're doing all this rearranging let's give them their own column to the immediate right of their current location. I use the default light grey color for this column.

Let's also move Siege Engineering to the right edge of the engineering set, to match Siege Operating opposite it.

Butchery, tanning, leatherworking, and bone carving are all components of the meat and leather industry, and so belong togethor. For this one I used a muddy leathery brown, RGB values 170 170 127.



Since there's no Other column anymore, let's set the hauling labors to their base white to make more sense of the skill-less labors.

Pottery and Glazing work as a pair. For these two I choose a light pink, RGB value 255-225-240.

Shearing, Spinning, Weaving, Clothesmaking, Dying, and Strand Extraction all have to do with the clothesmaking industry. For this one I used a downsampled version of one of the base pastel blues, RGB 155-205-255.

Glassmaking becomes the odd one out of the old crafts column, but folds nicely into jewelry—glass is just a fancy gem that can also be turned into furniture after all.

The remaining parts of the large farming cluster were a little trickier to organize. I ended up dividing it into two tranches with some color variation betwixt them (in color order, default, 218-199-175, default again, 85-170-127, 193-191-171, 85-170-127 again).

Then I toned down the medical task colors because the text is really hard to read in that dark a color. I moved this one down all the way to 140-112-114.

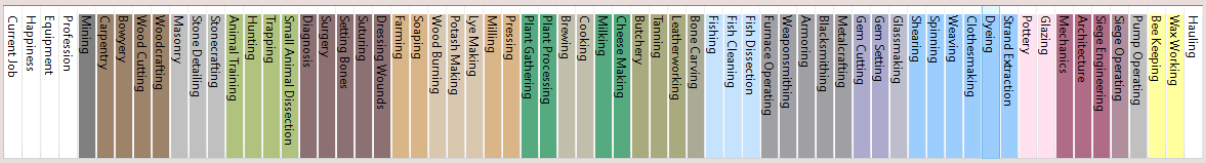
Now some name changes were in order. Why is it Farming (Fields)? Let's just set that to Farming. Why is it Haul/Push Vehicles? Whenever you are using a vehicle you are pushing it; when you are hauling it to and from a stockpile it falls under Item Hauling. Let's just change that to Push Vehicles. While it is true that bowyers are only really crossbow-makers, as they don't make anything else, "bowery" is a much shorter and more elegant name: let's change it to that.

Finally, glassmaking and bone carving are kind of lopped onto their sets, and siege operating folds into siege engineering, so I fade those halfway down the coloration scale to individualize them.

The finished result:

It's organized, easy to view, fully color-coded, and nicely streamlined; half an hour well spent.

The "Super Labors" feature added since the first version of this guide was published allows us to make one further, optional refinement to this view: merging all of the hauling sublabors into one. We can use either the example "Hauler" custom profession we defined earlier, or a new, explicit superlabor:



On my 21-inch screen, this was enough to allow me to *finally* use docks without horizontal scroll bars! There's a full spread on the next page.

11.3 Exporting and Importing Grid Views

The ability to export and import grid views is very important, given the amount of work that must go into reproducing a custom view, and both options are available under the "File" header in the taskbar.

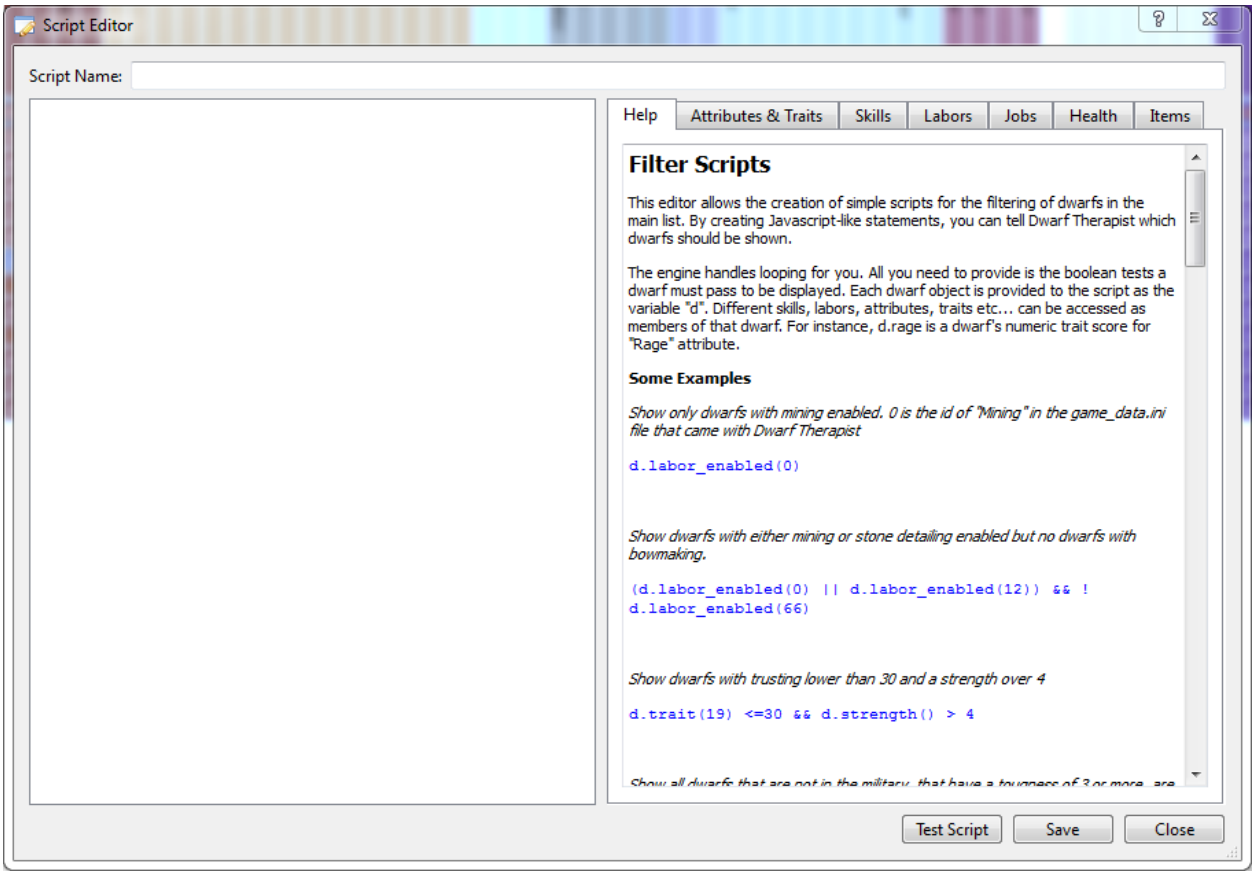

Dwarf Therapist - Mörulemgash, "Pagedriders"
File Scripting Roles Optimizer Windows Help
Group By Nothing
Filter Dwarves
Add Filter
Active Filters
88/8/6 Dwarves 0 Pending Changes
Add
Labors
Military
Social
Attributes
Roles
Animals
Recruitment
Labor
Current Job
Happiness
Equipment
Profession
Mining
Carpentry
Bowyery
Wood Cutting
Woodcrafting
Masonry
Stone Detailing
Stonecrafting
Animal Training
Hunting
Trapping
Small Animal Dissection
Diagnosis
Surgery
Setting Bones
Suturing
Dressing Wounds
Farming
Soaping
Wood Burning
Potash Making
Lye Making
Milling
Pressing
Plant Gathering
Plant Processing
Brewing
Cooking
Milking
Cheese Making
Butchery
Tanning
Leatherworking
Bone Carving
Fishing
Fish Cleaning
Fish Dissection
Furnace Operating
Weaponsmithing
Armoring
Blacksmithing
Metalcrafting
Gem Cutting
Gem Setting
Glassmaking
Shearing
Spinning
Weaving
Clothesmaking
Dyeing
Strand Extraction
Pottery
Glazing
Mechanics
Architecture
Siege Engineering
Siege Operating
Pump Operating
Bee Keeping
Wax Working
Hauling
Aban Oltarbardum
Alâth Ágeshrith
Alâth Alakkilrud
Asmel Tobulthad
Ast Zulbanroder
Atír Degëldesis
Bomrek Ittáskeskal
Catten Orameral
Cerol Dalzatmörul
Cog Eribágesh
Dakost Vabókonrel
Dastot Rigóthasrer
Dastot Urdimotam
Degël Evonkol
Dodók Dodóklaltur
Domas Umstizatír
Ducim Ónultinóth
Edëm Isanfikod
☼ Edzul Koganbungek ☼
Erush Namiden
Èzum Mistêmdomas
Fath Kosothlilum
Fikod Zefonabsam
Goden Zatamsákzul
Id Etägdeler
Imush Likotstukos
Ingish Shakethoddom
Inod Dasnasttobul
Îton Sibrekám
Kivish Astteshkad
Kivish Atîsginet
Kogan Shegetendok
Kogan Vathezmeng
Kol Mesirzulban
Kosoth Eriblikot
☼ Kûbuk Athelarros ☼
Libash Akmammelbil
Litast Zonstigaz
Mafol Mengelis
Thoughts
Pending Changes
Search
Thought
Count
Description
Dining (legenda... 77 Dined in a lege...
Bedroom (very ... 70 Slept in a very g...
Admired (owne... 65 Admired their o...
Admired (buildi... 62 Admired a buil...
Work (satisfied) 48 Has been satisfi...
Weather (rain) 41 Was caught in t...
Bedroom (great) 13 Slept in a great ...
Talked (family) 11 Talked with a fa...
Tired 9 Has been tired l...
Sparring 9 Had a satisfying...
Thirst 8 Has complaine...
Slept very unea... 7 Slept very unea...
Injuries (water) 6 Received water ...
Meal (fine) 6 Ate a fine dish l...
Sleep interrupted 6 Was woken by ...
Slept uneasily 6 Slept uneasily d...
Meal (decent) 5 Ate a pretty dec...
Sun (irritated) 4 Was irritated by ...
Drink (decadent) 4 Had a truly dec...
Drink (fine) 4 Had a fine drink...
Drink (decent) 4 Had a pretty de...
Flies 4 Has been anno...
Miasma 4 Was disgusted ...
Injuries (gave w... 3 Gave somebod...
Clear Filter
Grid Views
Customizations
Super Labors
Hauling
Custom Professions
Swordsdwarf
Speardwarf
Pickdwarf
Meleedwarf
Marksdwarf
Macedwarf
Hammerdwarf
Axedwarf
Custom Icons
Custom Profession
Super Labor

Part IV
Expert Features

12 Filter Scripts

Dwarf Fortress provides two different, easy-to-use tools for organizing your dwarves. In this section we'll introduce a third, much more advanced tool for the task: filter scripts. With custom filter scripts you can filter out those dwarves that you don't need to see right now from those that you do in a much more powerful, and much more refinable, way than grouping or sorting allows. However, it's also a challenging thing to do, as it requires that you learn and master the program's syntax for the task; indeed, if you do not have experience with writing programming code you could very easily become lost here.

Go to the dedicated Scripting item on the menu bar and hit `Add New Filter Script` to bring up the script creation and modification dialogue:



As you can see, on the right side there is a fairly detailed demonstration of what filter scripts are meant to do, and then further down the list we get a list of methods we can use and then several tabulated references for labor, trait, skill, and attribute ids. You can actually collapse this away to the side or expand it to take up the whole view by dragging the right edge of the box.

Filter scripts work by generating a boolean test for your dwarves and then iterating through them. Dwarf Therapist handles looping for you, so your job is simply to write a useful filter: basically, at the end of the application of your filter to a dwarf, we want to end up with either a "true" or "false" statement. If the result is false, the dwarf will not be displayed; if it is true, they will be. All of the commands that you can

enter into the script editor are all meant to be called on the "d" object, the abstracted dwarf in question, through the dot operator: `d.is_child()`, for instance. The options are documented fairly well in the lookup box on the right of the box—here's a partial list of some of the commands available to you:

Command	Return	Description
`is_child()`	boolean	Returns true if d is a child, else false.
`is_adult()`	boolean	Returns true if d is an adult, else false.
`is_animal()`	boolean	Returns true if d is an animal, else false.
`profession()`	string	Returns the basal profession string of a dwarf.
`raw_profession()`	integer	Returns the raw basal profession ID number of a dwarf.
`custom_profession_name()`	string	Returns the raw custom profession string, NULL if none.
`nice_name()`	string	Returns the nickname string, NULL if none.
`noble_position()`	string	Returns comma separated list of noble positions.
`get_raw_happiness()`	integer	Returns the raw happiness value of the dwarf.
`attribute(attribute_id)`	integer	Given the ID number, returns a dwarven attribute value.
`active_military()`	boolean	Returns true if the dwarf in an active military squad.
`squad_id()`	integer	Returns squad ID (from 0 by order of formation).
`can_set_labors()`	boolean	Returns false if dwarf is a child or baby.
`labor_enabled(id)`	boolean	Is this labor (by id number) enabled on this dwarf.
`is_labor_state_dirty(id)`	boolean	Returns whether there are pending changes for this skill.
`labor_rating(id)`	integer	Return's the dwarf's skill in a labor.
`trait(trait_id)`	integer	Returns raw trait value by ID number.
`total_assigned_labors()`	integer	Returns the total number of assigned labors for this dwarf. Optionally takes a boolean value: if set to false, does not include hauling labors.
`skill_level(int skill_id, bool raw, bool precise)`		Returns a floating point value, or "float". Raw uses the uncapped skill level, precise returns a decimal skill level.
`has_health_issue(category, index)`	boolean	Returns the health status of this dwarf. The optional index item allows you to check for a specific condition.

In addition to being able to call on attributes through `attribute()`, you can also call on them directly by name:

```
int strength()                int focus()                   int spatial_sense()
int agility()                 int willpower()               int musicality()
int toughness()               int creativity()              int kinesthetic_sense()
int endurance()               int intuition()               int empathy()
int recuperation()            int patience()                int social_awareness()
int disease_resistance()      int memory()
int analytical_ability()      int linguistic_ability()
```

As for logical construction, Dwarf Therapist uses standard boolean operation notation. `||` stands for OR, and two statements linked in such a way will return true if either or both are true. `&&` means AND, and will only return true if *both* statements are true. Statements based around a `==` operator will be evaluated for equivalency, and will return true if they are, and false if they are not. Statements surrounded by `()` operators will be evaluated ahead in PEMDAS order, much like they are in algebra. Finally, adding a `!` before a boolean statement negates it—false becomes true and true becomes false. Integers can be compared with `<` and `>` operators as well as the `==` one. Strings must be surrounded in double quotes, `"Like This"`.

12.1 Writing Complex Scripts

Now that we have the basic syntax down, let's use filtering to solve a non-trivial problem. Whenever a large migrant waves arrive at a fortress, or even a small one in a lot of cases, what happens is that you pick the best of the bunch and set them to work immediately, and get the rest of the wave doing generic tasks that are plentiful and easy to designate—hauling things, getting rid of loose stone, building walls and other constructions, smoothing and engraving the fortress living spaces, and so forth. Integrating a new wave into your fortress is a slow but steady process, involving picking off individual dwarves for tasks you need done on a longer term one by one. Some will become jewelers, some will start operating furnaces, some will build parts for your pump stack, some will be enlisted in the military—and some will remain plain old haulers.

In **"Using Roles—The Sort Method**" we discussed combining groups, sorts, and roles to find ideal dwarves for a particular task within a group, but we were hamstrung by the limitations of a group: there's no easy way to group "gainfully employed" dwarves committed to their tasks apart from "part-time" ones that aren't. Your options were to make do with grouping them into migrant waves, which doesn't usually end with you selecting the best available dwarf in the *fortress* for the task, or not grouping them at all, which requires you browse through dwarves that are already working on something and risks switching the tasks of a dwarf you'd designated for a new role earlier (a problem discussed in **"Assigning Nicknames**"). We're going to neatly resolve this little problem with a script we're going to write.

In my fort I just started funneling my dwarves into tower fortress building duty.

Whenever you write a script the first question you've got to ask is, "what are the characteristics of a dwarf that I want" (if you're writing an *inclusive* script), or "what are the characteristics of a dwarf that I *don't* want" (if you're writing an *exclusive* one). In this case we're writing an inclusive filter meant to root out migrant dwarves that are available for full-time assignment to useful tasks. If we think about what this implies, we can come up with a number of "characteristics" for such dwarves (in order of complexity):

1. They have all hauling labors enabled. This is one of the most apparent indicators of a "working-class" dwarf, but it's nowhere near exclusive.

2. They don't have a nickname. Assuming you follow the advice given in **"Assigning Nicknames**", nicked dwarves have already been dedicated to something.

3. They have the masonry and/or stone detailing labors enabled, but are never above "adequate" skill in the former (since actually building stone blocks is assigned to dedicated masons), and never above "competent" in the latter (I consider "skilled" the breaking point for when an engraver is actually worth his salt, and should be taken out of the working-class pool).

4. They are never enlisted in the military (at least, not permanently). At least in *my* fortress, once a crossbowdwarf, always a crossbowdwarf slash hunter.

5. They never have certain "key" labors that are handled by dedicated dwarves enabled (mining, carpentry, woodcutting, stonecrafting, cooking, brewing, any of the metalsmithing tasks, either of the jewelry tasks, and clothesmaking). The precise composition of this list may vary somewhat for you, but most players learn to dedicate certain tasks to certain dwarves to maximize results very quickly.

6. If they are skilled in certain useless or niche tasks (animal caretaking, small animal dissection, fish dissection, bee keeping, wax working, soap making) they have those tasks enabled. No one creates extra work for themselves by actually turning these *off*, at least not until you want this dwarf doing something for you.

Now this is a pretty extensive list of characteristics common to our "working class" dwarves, and most of them require we do some thinking through as they're not immediately obvious. Hopefully this set of

conditions both accurate and precise enough to work. To write such a complex script, let's break it down into individual steps.

All Hauling Labors are Enabled

This one's pretty annoying; we have to form an AND string out of `labor_enabled() == true` calls. However, a smarter solution that requires less work, both by the program and by us, would be to call `total_assigned_labors()` twice, once asking for labors with hauling included, once without, and subtract to see if we get the number we want. The behavior of this command is actually non-trivial: not only regular hauling but the two medical chores are folded in as well, and this isn't said anywhere in the documentation (well, now it is). That means that our magic number is 11:

```
d.total_assigned_labors(true)-d.total_assigned_labors(false) == 11
```

This script alone reduced my fortress from 70 to 38 candidates! In fact, the capacity to filter your dwarves by whether or not they have hauling enabled is actually extremely useful on its own, and there's no other way to do this kind of thing in the program. So let's keep it! Give the script a name and hit "Save". We can actually also write a quick Hauling *Disabled* script, too, now:

```
d.total_assigned_labors(true)-d.total_assigned_labors(false) <= 10
```

If Masonry or Stone Detailing are Enabled, they are at a low Skill Level

Masonry is labor number 13 on the list, and stone detailing is number 12. We write separate tests, one asking if the dwarf has masonry enabled but is below skill level 3 in it, and one asking if they have stone detailing enabled but are below skill level 4 in it. We then link these with an OR. This is what the complete condition test looks like:

```
(((d.labor_enabled(13) == true &&  d.labor_rating(13) < 3) ||
d.labor_enabled(13) == false)||
((d.labor_enabled(12) == true &&  d.labor_rating(12) < 4) ||
d.labor_enabled(12) == false))
```

Then we create a new "Available for Work" script, and within it link the two statements we've written so far with an AND. So far, so good: on to the next condition.

They are Never Enlisted in the Military

This one's elementary, just test if the dwarf is in an active military squad and slap a `!` on it:

```
!d.active_military()
```

This isn't that useful as a standalone filter because there's a group for it. Next!

They Never have a Nickname

This is fairly simple, though the call is somewhat confusingly named:

```
d.nice_name()==""
```

They Never have Certain Key Labors Enabled

This one involves a lot of table lookup:

```
!d.labor_enabled(47) &&       !d.labor_enabled(38) &&       !d.labor_enabled(00) &&
!d.labor_enabled(48) &&       !d.labor_enabled(45) &&       !d.labor_enabled(53) &&
!d.labor_enabled(29) &&       !d.labor_enabled(50) &&       !d.labor_enabled(46)
!d.labor_enabled(11) &&       !d.labor_enabled(51) &&
!d.labor_enabled(33) &&       !d.labor_enabled(49) &&
```

If you drop the negations and use OR statements, you pretty much get a list of key dwarves in your fortress: I call it "Key Dwarves". It's very useful for getting rid of new migrants who happen to be novices in skills that are dedicated to, say, my legendary woodcutter, so that they don't take up our only axe to cut down a tree a minute while the *real* lumberjack sits around doing nothing in particular.

Niche and Useless Labors Still On

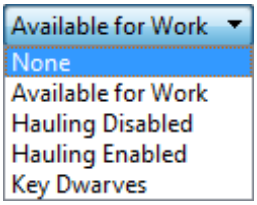
This is pretty much an inversion of the above: there we had key labors off, here we have useless ones on, but since it's conditional (and we don't have if statements available to us) it's a little more complex. It's important to note that dabbling is considered skill zero—*completely* unskilled is considered skill level -1. So it's time for some more table lookup:

```
((d.labor_rating(16) > 0 && d.labor_enabled(16)) || (d.labor_rating(16) <= 0)) &&
((d.labor_rating(43) > 0 && d.labor_enabled(43)) || (d.labor_rating(43) <= 0)) &&
((d.labor_rating(26) > 0 && d.labor_enabled(26)) || (d.labor_rating(26) <= 0)) &&
((d.labor_rating(72) > 0 && d.labor_enabled(72)) || (d.labor_rating(72) <= 0)) &&
((d.labor_rating(71) > 0 && d.labor_enabled(71)) || (d.labor_rating(71) <= 0))
```

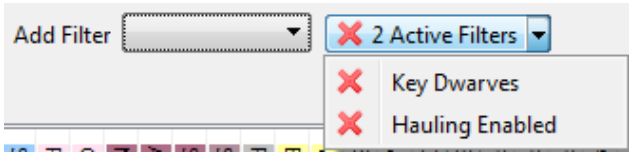
Those are all our conditions; behold, the completed script!

```
// hauling test
(d.total_assigned_labors(true) - d.total_assigned_labors(false) == 11) &&
// masonry and stone detailing test
(((d.labor_enabled(13) == true &&  d.labor_rating(13) < 3) ||
d.labor_enabled(13) == false)  ||  ((d.labor_enabled(12) == true &&
d.labor_rating(12) < 4)  || d.labor_enabled(12) == false)) &&
// nickname test
(d.nice_name == "") &&
// military duty test
!d.active_military() &&
// key dwarf test
(!d.labor_enabled(47) && !d.labor_enabled(48) && !d.labor_enabled(29)
&& !d.labor_enabled(11) && !d.labor_enabled(33) && !d.labor_enabled(38)
&& !d.labor_enabled(45) && !d.labor_enabled(50) && !d.labor_enabled(51)
&& !d.labor_enabled(49) && !d.labor_enabled(00) && !d.labor_enabled(53)
&& !d.labor_enabled(46)) &&
// useless labors test
((d.labor_rating(16) > 0 && d.labor_enabled(16)) || d.labor_rating(16) <= 0)
&& // Animal Tr.
((d.labor_rating(43) > 0 && d.labor_enabled(43)) || d.labor_rating(43) <= 0)
&& // Fish Diss.
((d.labor_rating(26) > 0 && d.labor_enabled(26)) || d.labor_rating(26) <= 0)
&& // Animal Diss.
((d.labor_rating(72) > 0 && d.labor_enabled(72)) || d.labor_rating(72) <= 0)
```

Over the course of composing this script we actually wrote three other useful scripts, which I think is a *pretty good* demonstration of their utility. Unfortunately Dwarf Therapist does not provide any facilities for exporting or importing filter scripts, which is a unfortunate, because filter scripts get very complicated and having to copy other people's scripts manually is very annoying, as even a single error or typo will likely invalidate the entire thing. If you like the scripts that were provided here, just copy-paste them into your program!



12.2 Running Filter Scripts



Once you have a complete filter script running it is a matter of navigating to the "Add Filter" item on the indicator bar, going to the drop-down menu, and activating your script. Crucially, Dwarf Therapist allows you to run multiple filter scripts simultaneously, allowing a useful degree of finesse in your filtering. The sidebar by the drop-down menu will display the number of scripts you have active; clicking on it removes all active filters and resets the screen. If multiple scripts are active you can use the drop-down menu to remove them individually as well. This allows you to easily check how many of your key dwarves have hauling enabled, for instance, and to perform other such flexible tasks.

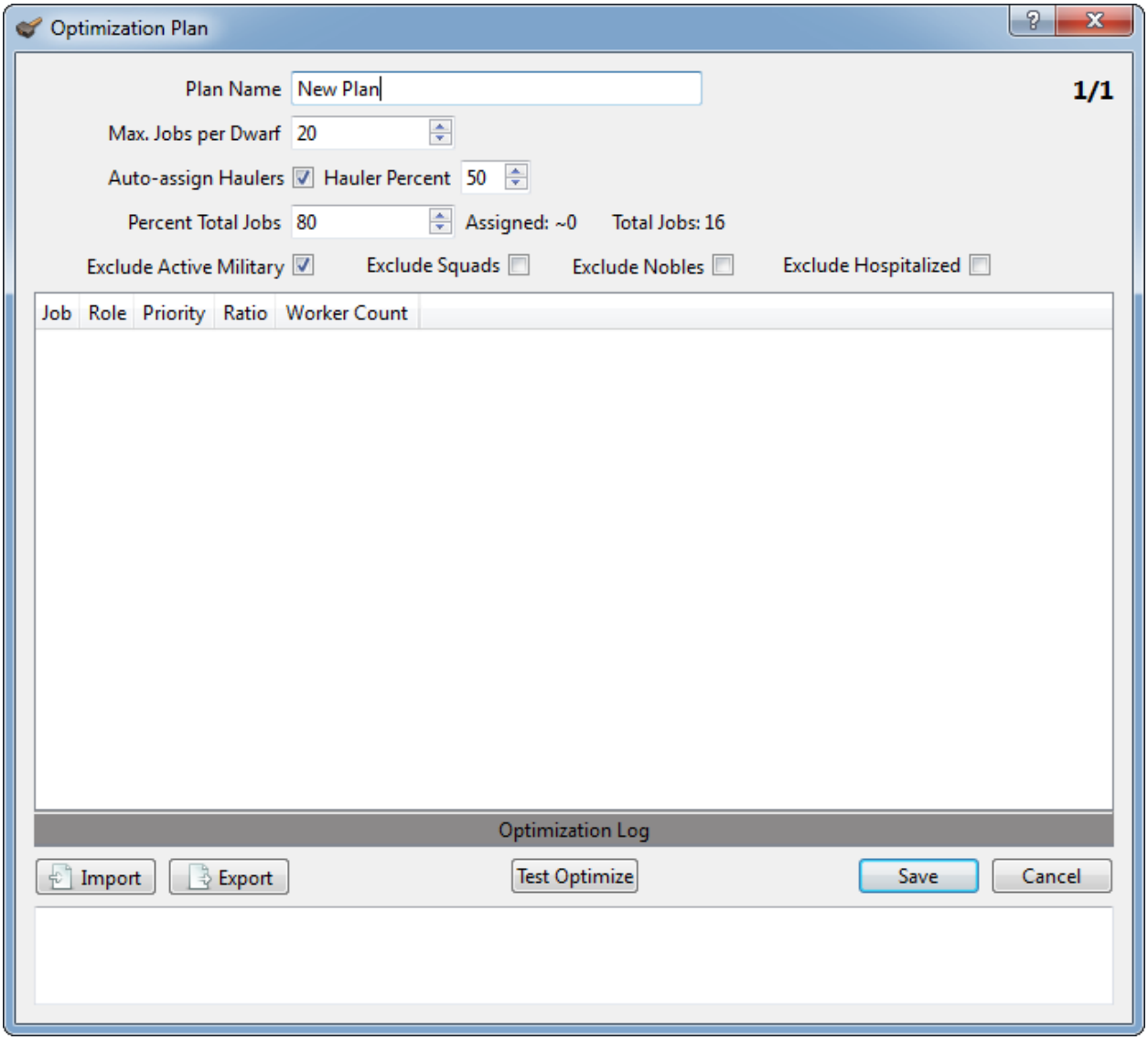
Furthermore, by typing into the "Filter Dwarves" text field, you can search for your dwarves by name and by item preference, or through an amalgamation of the two. This is the easiest way to find an individual dwarf by name, as briefly mentioned in the introductory section **"Group By and Filters"**, and allows you to search dwarves by preference without having to rely on the "Preferences" dock. Indeed, all of the docks that include a search capacity—the "Thoughts", "Preferences", and "Health Legend", specifically—execute their searches through a filter, and this filter will be applied through, and removable by, the "Active Filters" button. This dynamic filtering capacity is a feature currently under development, and health and preference filters will be added by future version of Dwarf Therapist.

12.3 Exporting and Importing Filter Scripts

Unfortunately Dwarf Therapist does not currently provide an interface for exporting or importing filter scripts beyond the ability to copy paste the contents of the script editing pane. Such a feature is planned for a future version of the utility.

13 Optimization Plans

Optimization plans are a (somewhat complicated) way to automate the labor assignment process that we've so far been doing manually. To access it, go to `Optimization > New Optimization Plan`, which should bring up a screen similar to the following one:



This isn't the easiest of screens to piece apart, so let's look at what each option is meant to do first. It isn't immediately apparent, but the labor optimizer works by assigning jobs in a ratio-wise manner. The two numbers in the top right corner tell you how many dwarves are being considered, and how many of those dwarves will have their labors specialized in the current assignment scheme. If you do not select any dwarves the optimizer will work with all available dwarves, but if you select a dwarf (by clicking on their name) or multiple dwarves (by dragging the mouse down dwarves in a column, or by clicking on the first dwarf and shift-clicking on the last one) it will constrain itself to those dwarves.[26] You can use filters to only display those dwarves that you want to be optimized—I recommend using the "Available for Work" filter we just

[26] You can also select all with the `Ctrl + A` hotkey.

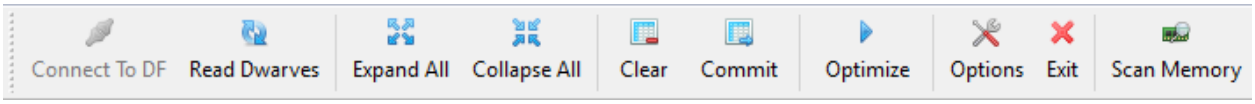
wrote in the last section, **"Writing Complex Scripts"**.

Let's use the optimizer for a simple task—say, assigning (role-optimized) dedicated wood burner and furnace operator from betwixt a few dwarves. Open a new optimization plan again. Set "max jobs per dwarf" to 1. This obviously restricts the maximum number of jobs a dwarf can be assigned to just one job, which makes sense given what we're trying to do. Disable "auto-assign haulers"—this is a more advanced feature that we'll talk about in a moment. Now set "Percent Total Jobs" to 100. This number tells the optimizer that we want all of the jobs that these dwarves can be assigned to be assigned in our optimization scheme.

Roll your mouse over the empty white space and right click to bring up a menu of labors, and select first "Wood Burning" and second "Smelting" from the list. You can add any number of labors to the list in this manner, and you can easily delete any labors you've already added by right clicking and hitting "Remove Selected".

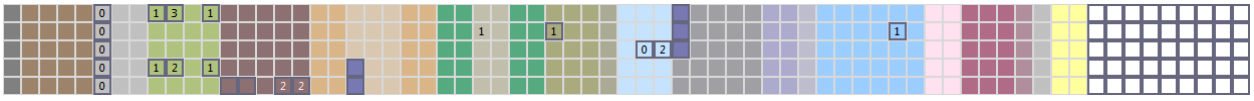
The first thing listed here is the job—the labor title that you've select. The next item is the role by which the optimizer is examining your dwarves' fitness: the one assigned to the job at hand by default. It's possible to use custom roles here. For the task at hand, however, leave this as is. Priority, meanwhile, changes the weight with which role fitness is considered, and so shifts overlaps in favor of the higher-priority labor. The ratio changes the amount of dwarves that will be assigned this labor by the optimizer relative to the set. For any particular job the ratio is divided by the sum of the ratios, giving you the percentage of jobs that will be assigned under that labor, which when multiplied by the number of jobs to be assigned gives you the last column—the worker count.

We don't have to actually change anything here: everything seems to be in order, with one job going out for wood burning and one for furnace operating. Let's name our plan "Test Plan" and save it. This allows us to edit or remove our new optimization plan from its associated taskbar item, and you can test your plan in-view using the "Test Optimize" button. Properly applying your designation, however, requires a new item that appears on your main menu bar—the optimization button.



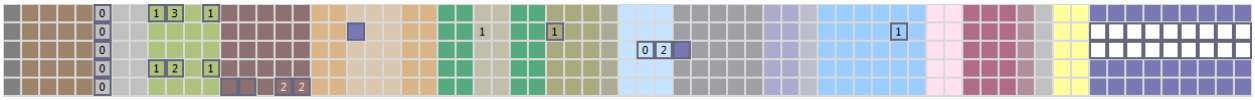
This button will not appear when you don't have any optimization plans saved. When you have multiple optimization plans, a button appears besides it that lets you drop down a menu to select which script is the active one—this also applies the script in question, saving you a mouse click.

Now selecting any number (or, as earlier, selecting none and therefore all) of dwarves and hitting Optimize will cleave them in two, between the wood burners and the smelters. If the number of dwarves selected is odd you will get an uneven number of job divisions—in this case three furnace operators but only two wood burners.



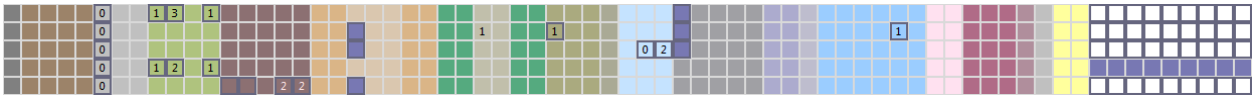
Now let's add a fold of complexity to our plan by including hauling as well. To edit an optimization plan, go to "Optimizer" on the taskbar and select the plan from the "Edit Optimization Plan" menu. This time let's turn auto-assign haulers on and set it to 50 percent: likewise, set the total jobs percentage to 50 as well. Now hit "Test Optimize" at the bottom of the window to see what effect this plan has on our dwarves (I deliberately avoided doing this earlier to showcase predefined usage and the changes to the menu bar). As

you might have guessed this cleaves our dwarves in two: a quarter each are assigned dedicated wood burning or furnace operating, and the remaining half are made haulers, with their other labors disabled. A note that needs to be made: optimization plans will obviously only work properly if roles are tuned to the default skill rank setting we discussed in **"Roles"**.



From our little group of five dwarves this results in one wood burner, one furnace operator, and three haulers. Once again because five is indivisible by two the division is uneven, with more haulers being assigned than workers. This is the reason that the numbers that the dialogue gives us are approximate - if the numbers don't fold there will inevitably be some fudging on the corners.

Let's dig a little deeper. Set the maximum number of jobs a dwarf can have to 2 this time, and test the script again to see what effect this has:



Unless you're particularly insightful, it's probably not immediately apparent what's going on here—why is only one dwarf hauling anything? So far we've generated three optimization scenarios; now let's use them to get a better understanding of how the labor optimizer works.

The percent total jobs parameter is a cap on how many jobs can be assigned, out of how many total possible jobs there are. In the first example this number was set to 100, so the labor optimizer could give every dwarf a job to do. Since the max jobs per dwarf parameter was set to 1, every dwarf could only get one job total. Since we have two labors of equal priority under consideration, this means that half of the dwarves will recieve the wood burning task, and nothing else, and half would recieve the furnace operating task, and nothing else.

In the second example, we reduced the cap to fifty percent, and kept the number of jobs per dwarf at 1. This means that *fifty* percent of dwarves will be assigned *one* job. Indeed, ignoring some fudging that the program had to do, again because five is not divisible by two, half of half of the dwarves recieved the wood burning labor and half of half of them received the furnace operating labor.

How did the program behave in the last example? This time the percent labor cap (let's just call it the labor cap from now on) was still set to 50, but the maximum number of allowed jobs (let's just call it the job cap from now on) was set to 2. We still have two labors, but now we also have two "spaces" for them to be assigned to. In the resulting configuration *fifty* percent of dwarves are assigned wood burning, but then *another* fifty percent are *independently* assigned furnace operating. Logically, because the labor optimizer has been allowed to assign jobs twice instead of only once, dwarves that are fitter than the group average at both wood burning *and* furnace operating will be assigned both jobs. The labor cap no longer regulates how many jobs the two labors together can be assigned, but how many times they can appear individually. Under the single-job scheme, two labors had to contend against one another under the fifty percent job cap, and so each labor could only be turned on 25 percent of the time; under the two-jobs scheme this is no longer the case, and so each labor could be turned on a full 50 percent of the time.

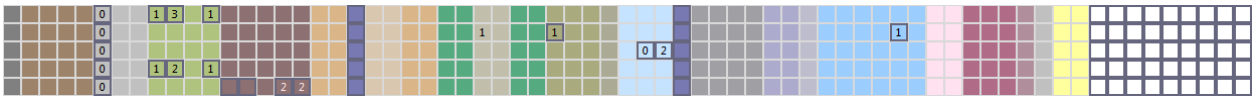
In another form, the number of labors that will be turned on will thus be given by the following equation (note that you have to divide the labor cap by a hundred because it is in percentage form):

$$jobs\ cap \times number\ of\ dwarves \times \frac{labor\ cap}{100} = number\ of\ labors\ to\ be\ assigned$$

And the number of assignments for each individual labor, which is dependent on the ratio, is as follows:

$$number\ of\ labors\ to\ be\ assigned \times \frac{that\ labor's\ ratio}{sum\ of\ labor\ ratios}$$

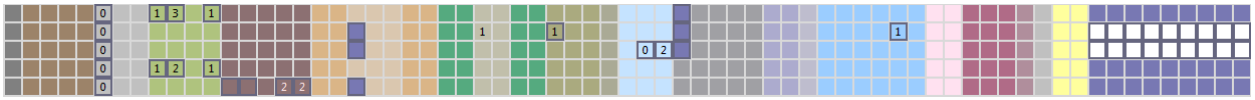
Let's take this to its logical conclusion: what would happen if we kept jobs cap at 2, but raised the labor cap to 100 percent? Logically that would mean that every instance of that labor will be assigned - and a quick test confirms that, indeed, that is the case:



What about the funkiness with the assignment of hauling in example three? If you were following along with the examples I was giving, and didn't check the tooltip text on the Hauler Percent box in the dialogue, you might have (wrongly) concluded based on the parameter's behavior in examples one and two that the optimizer assigns hauling to a certain percentage of the total dwarves under consideration. That is not the case: rather, that percentage is a bit of dwarf-wise post-processing optimization based on how many labors that dwarf already has assigned.

Basically, the optimizer assigns labors, then goes down the list and asks each dwarf how many labors they have assigned: one? Two? None? It then compares this to the "Hauler Percent" value (hauler threshold from now on), and if the dwarf has fewer than that percent of the maximum number of labors assigned, then they are assigned hauling tasks. In the example above every dwarf has both labors enabled, and so obviously no dwarf falls under the fifty percent threshold—and no dwarf is assigned hauling. In example two three of our dwarves don't have anything assigned post-processing, so they obviously get hauling booted onto them.

Example three actually demonstrates an optimization behavior that's important to know: that the hauling threshold is strict. Dwarves one and five both have one labor assigned, which is half of two, the number of labors they *could* have assigned. In percent form one over two is fifty percent: on the border of our threshold, but not below it. To get the behavior we want, increase the threshold to 100 percent:

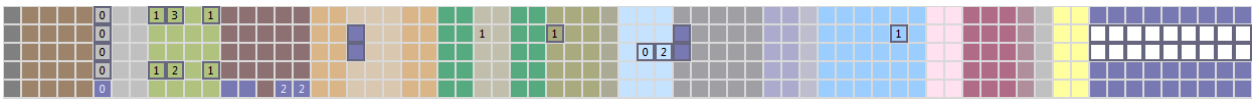


The number required is 100 percent, and not 51 percent, because of the program's behavior.

There's just one more thing to be said: you can exclude various groupings from optimization right from the dialogue by unchecking their associated boxes:

Excluding hospitalized dwarves is important if you want the jobs done now, but isn't necessary if no one (or no one freely available to work *and* under consideration) is injured, and may be counterproductive if on the flip side a significant number of your dwarves have sustained recoverable wounds. Excluding nobles is a poorly optimized solution because while assigned nobles work as normal, royal nobles will not have much of a work ethic regardless of what tasks you assign to them—you usually won't be considering nobles regardless, so not excluding them is a safe bet. There is some overlap between "active military" and "squads": dwarves are considered to be on active duty when they are on call, correspondingly appearing by their military position in-game—but to get that far they obviously have to be assigned to a squad first. Excluding squads is important when your military is fully professional, but of dubious use when you have a attack-that-thing-now dwarven militia that you never disbanded.

As it turns out, dwarf number five in our examples above is actually a noble—I just haven't been excluding him in the optimization process. Doing so results in exactly the sort of behavior you would expect—he's ignored—and has the nice side effect of tidying up our "five divided by two" problem.

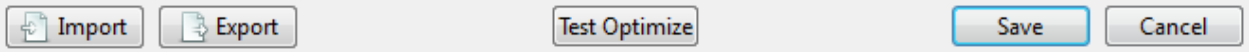


13.1 Using Optimization Plans

See **"Putting it all Together"**.

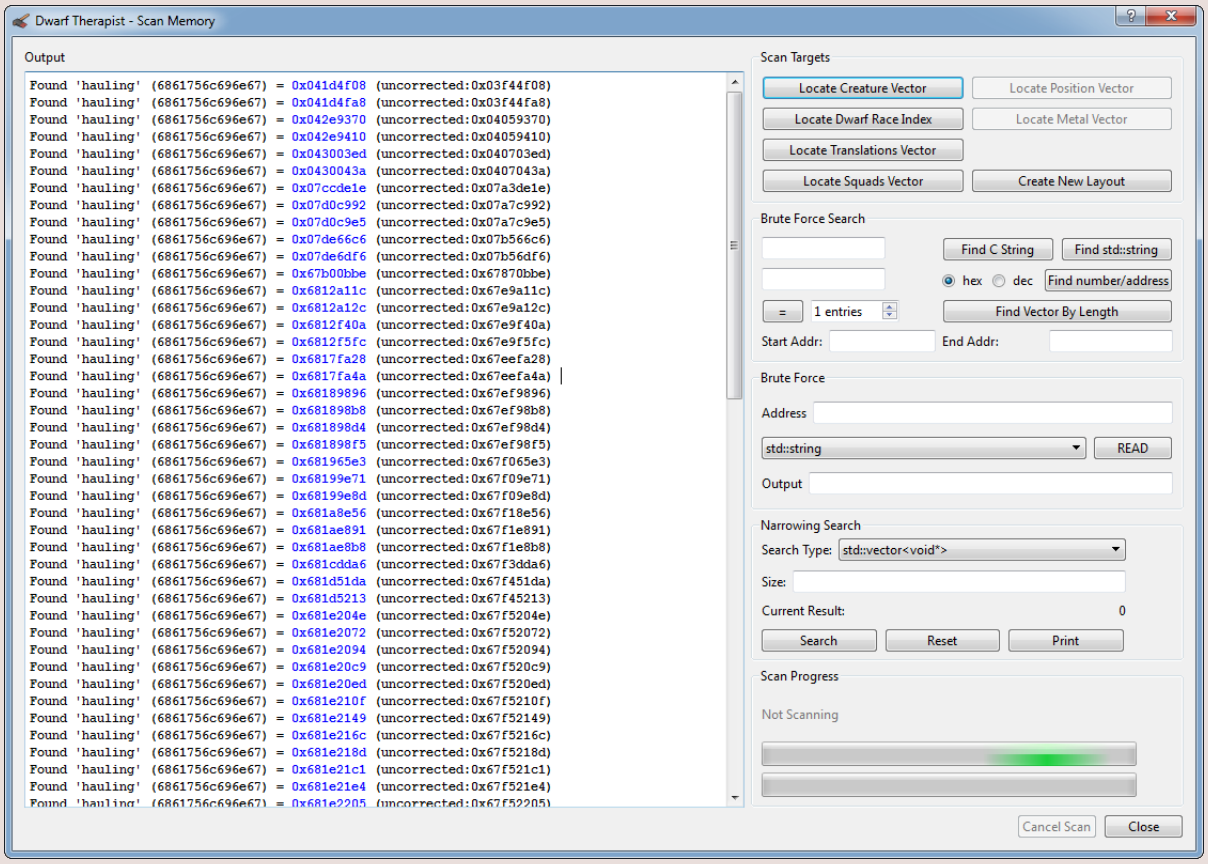
13.2 Exporting and Importing Optimization Plans

Like most of the configurable utilities packaged into Dwarf Therapist, optimization plans can be exported and made available for others to use, or imported and made available for use in your program. This feature is only available from the options bar on the optimization plan editing menu, as it doesn't appear in the Optimization taskbar item.



14 Addendum: Memory Tools

If you click on the "Scan Memory" item in the File menu you will be brought to the Dwarf Therapist memory scanning utility:



The result of a brute-force search for the string "hauling".

This will not be covered in this guide. Dwarf Fortress memory mapping and modification is not for the faint of heart, and is used for two things: finding the RAM values for things necessary to get complex utilities and mods working (like, say, Dwarf Therapist), and cheating the game by changing them. The first is way out of the scope of this guide, and for the second there are much more elegant tools available: as labor management has been given a GUI by the community, so to has memory access and modification. I'm also not going to pretend I fully understand how the tool even *works*. Additionally, if you right click on a dwarf's name and scroll to "Memory Tools" you will see that there are some memory options available for individual dwarves as well. You can "Dump Memory" to open the memory matrix associated with that dwarf tabulated in a text box by the program. "Dump Memory to File" will also read the dwarf's memory values into a chart, but will save it to a `TXT` file in the Dwarf Therapist log subfolder. Finally, you can "Copy Address to Clipboard" to copy that dwarf's memory location to your clipboard. This function may be useful if you're interested in modding your dwarves in-game, but once again it's not something the average user would need.

15 Putting it all Together

We have now individually covered all of the features available to you in Dwarf Therapist, and so we are ready to put togethor everything we have learned so far and employ towards solving a particularly complex task: military recruitment.

One of the most time-consuming and complex tasks in Dwarf Fortress is the creation, assignment, and management of military dwarves and military squads. Our goal in this section of the guide is to put together everything that we've learned up to now and apply it to this thorny problem, starting with streamlining the process for conscripting dwarves into our squads.

The first thing we want to do is think about what kind of a view we will need for this task, as the default military view is far too comprehensive for the purposes of simple recruitment. Instead we are going to build our own, specialized view for the task. Let's begin by looking at how squads in Dwarf Fortress are or ought to be structured. You can have up to ten dwarves per squad, with a squad leader, subordinate to your assigned militia commander noble, and up to nine other dwarves. You can give each dwarf in a squad an individual uniform, but it's easiest and most logical to make them uniform: every dwarf in a squad is equipped with the same weapons and approximately the same kit, uniform availability depending. Clearly our squad leader should differ from his compatriots: he needs to be not only an excellent fighter, but also an excellent teacher and leader, so we are going to need roles for both individual fighting dwarves, and slightly more demanding ones for their officers.

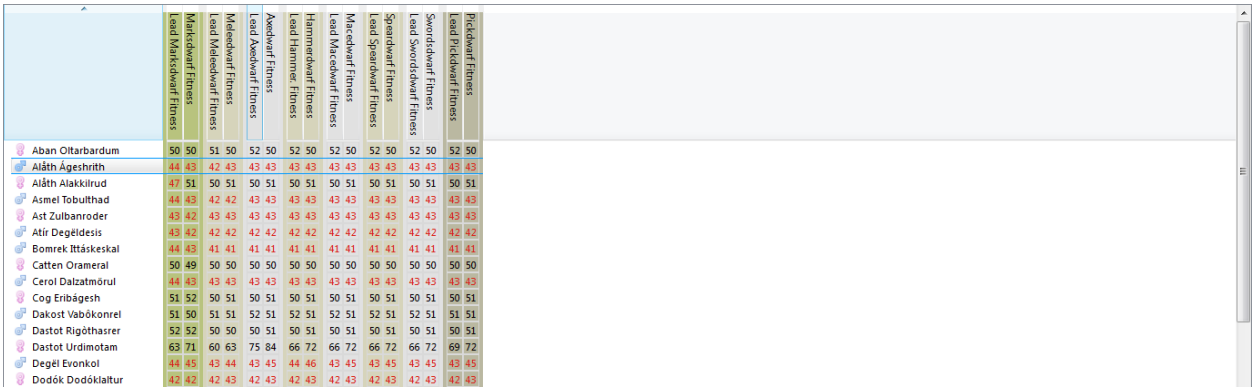
Dwarves can use any weapon that they can wield out of a certain large set of them—you can see the full list of wieldables, and whether or not individual dwarves can wield them, in the "Weapons" view or in the "Military" view. However, we are not going to concern ourselves with most of the items on this list, since they either cannot be produced domestically or cannot be wielded at all, and since dwarves will never come to your fortress with experience in weapons, like whips, which are not sufficiently "dwarvish". Thus our list of possible squad weapons is: battle axes, crossbows, maces, short swords, spears, picks, and war hammers. To be comprehensive, then, we will need to define a custom role for wielders of each of these weapons, as well as a parallel ones for their officers. Additionally we can define melee-generalist "meleedwarf" and "lead meleedwarf" roles, for squads with dwarves meant to equip whichever weapon they are most skilled in already, to better take advantage of pre-existing skill rank. That brings us to a total of sixteen custom roles, split between our regular conscripts and our officers. *However*, Dwarf Therapist ships with specific militiadwarf roles, excepting pickdwarf, already defined—so we have only the various officer dwarf roles, and the meleedwarf and pickdwarf roles, to define. Let's begin by writing these roles.

Step 1 What's the difference between a meleedwarf and an axedwarf, or a hammerdwarf, or so on? None, except that he is excepted to be versed in any one weapon, as opposed to a specific one of your choosing. So to generate a meleedwarf custom role, open up the Custom Role definition window with `Roles > New Custom Role`, and copy in any meleedwarf role—axedwarf is closest. Add to this role all of the domestic melee weapon skills and domestic weapon preferences not already listed, and save the role.

The process for creating a pickdwarf role mirrors that for creating the meeledwarf one, except that instead of importing all of the remaining weapons we instead kick out whatever weapon is in the role we copied, and add the mining skill and pickaxe preference.[27]

What makes for a good dwarven officer? Open up the role definition window again, and this time copy in your new meleedwarf role. Add to it the attributes (linguistic ability and social awareness) and skills (teacher) associated with the "Teacher" role, and save (you can also add some traits, like "bravery" and somesuch, if you'd like). For the rest of the officer roles, just repeat this process. Tedious, but not difficult—if you don't want to bother, I include a packaged export of everything we create here at the end of this section.

Step 2 Now that we have all of the roles we want to use defined and ready, let's create a part of the view in which we can use them. Open up the Grid View dock (`Windows > Docks > Grid Views`) and hit "Add a New Grid View". Name your view something appropriate—I called mine "Recruitment"—and let's add what we have so far.



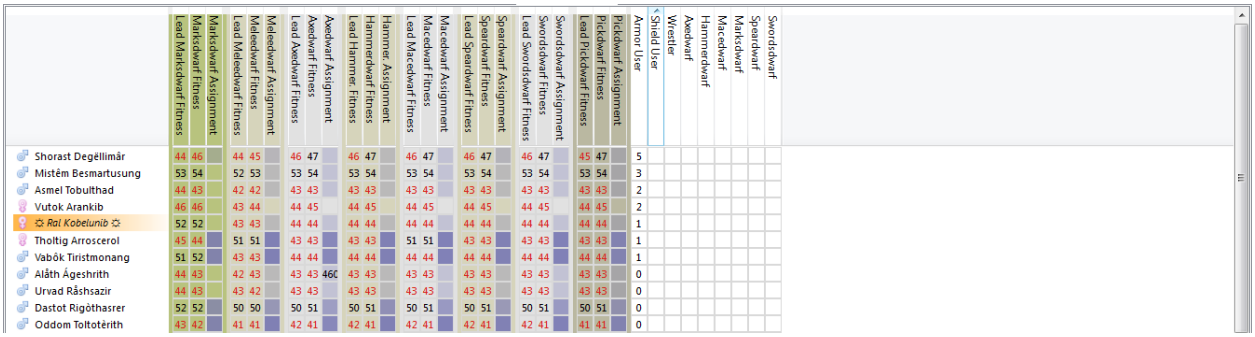
Note that the "Pickdwarf" columns are labor toggles. If you inspect them you'll notice that, in a behavior described earlier in the addendum to **"Using Roles—The View Method**", roles with skilled labors associated with them (in this case, mining) will be togglable for those labors.

Step 3 Within Dwarf Fortress only active-duty soldiers are assigned their military professions—when they are off-duty they are given their civilian professional names instead. This is fine when we have a part-time militia, but less helpful when we are trying to raise and train a professional military command. So let's write custom professions we can assign to fix this problem for us. No need to define lead dwarf professions, either—their status as assigned nobles tells all.

It's easiest to do this out of the "Customizations" dock. The labors I assign to my dwarves are hauling for everyone, pump operating for all meleedwarves (pumps that don't pump anything are a great physical training regimen), hunting for all marksdwarves, mining for all pickdwarves, and wood cutting for all axedwarves.

Step 4 Let's now add these professions to our view! And while we're at it, let's add a set of columns for experience in the raw military skillsets we're using.

[27] Picks are not predefined because they are hardly ever used for combat, being meant for mining and all that—they even level with the Mining skill, instead of a dedicated combat skill. Not a very sexy weapon, but very effective in a pinch, I hear.



Step 5 We now have our custom recruitment view in place, as well as a liturgy of appropriate new super-labors and professions in the customizations dock. The filter script we're going to use to weed fortress regulars from conscription is obvious—it's the availability script we wrote as an example in **"Filter Scripts"**. This leaves us with only one last thing to write: our optimization plan, or perhaps plans.

An optimization plan that optimizes just one squad of dwarves isn't strictly necessary, since you can sort the dwarves, assign them their labors, and then assign them the profession. Optimization plans can't assign professions, only labors, so you're not saving on much work with a single-squad plan. Instead we want to write a "Military Starter" optimization plan, similar to the "Industry Starter" plans that provide the bulk of this feature's utility. Usually, when I decide it's time to start a professional military, I start off with two squads: one of marksdwarves, and one with some sort of melee weapon. The usefulness of an optimization plan in this case is that it allows us to assign two squads of roughly equal parity. If we have a dwarf under consideration who is in the selection percentile for two different squads, then if you assign him manually, the squad he goes to will be a matter of which squad you assigned first. If you have an optimization plan, on the other hand, he'll go where he is needed most.

To do this, assign "Hunting" and "Pump Operating", the two labors which are unique to marksdwarves and militiadwarves, respectively, in equal amounts in your plan, and save.

Step 6 There is one last thing we need to write: a simple filter script that only displays dwarves with pending changes, or "dirty cells". You'll see in a little bit why this is necessary. The filter is simple in concept, but large in size, since it requires that we call `d.is_labor_state_dirty()` on all possible labors—all 73 of them!

We now have all the custom definitions we need to conscript our dwarves! Now let's walk through the process of actually assigning them.

Step 1 Filter your dwarves down to those that are available for assignment, using the availability script we wrote in **"Writing Complex Scripts"**.

Step 2 Sort the dwarves by officer fitness, first in marksdwarvemanship and second in meleedwarvemanship. Take note of the names of those dwarves that appear at the top of the list. Within Dwarf Fortress, go to the "Nobles" screen (`N`) and make the fittest dwarf you have for each officer role a militia captain, sheriff, captain of the guard, or militia commander, whichever is appropriate. Since this is only the start of our budding military, it's probably best to make the head meleedwarf the militia commander, and the head marksdwarf the captain of the guard or sherrif.[28] I also recommend you name the squads something functional, so you can distinguish between them at-a-glace in-game: "Fortress Guards" and "First Meleedwarves", for instance.

Step 3 Re-read dwarves from Dwarf Fortress, so that Dwarf Therapist can see the new squads. Filter them again down to those available for assignment.

[28]Dwarves with crossbows elect to dole out physical punishment by beating dwarves with their crossbows, hence why they make good guards. Assuming you make your crossbows out of wood, this will have *much* less gruesome results then, say, hacking at the poor dwarf with a sword!

Step 3 Select all dwarves displayed using `Ctrl + A` then go to the plan editor again. We want to optimize twenty dwarf, but have available some number of them, save, 80. With some quick math, it becomes apparent that we want to optimize 25 percent of our dwarves—so enter that value into the Percent Total Jobs textbox, and save. Now run the plan!

Numerical optimization, a feature planned for future releases, will automate this procedure.

Step 4 Now add the "Pending Changes" filter we defined in step six to the active filters, to remove those dwarves that escaped military assignment (this round) from the view.

Step 7 Click on each dwarf with pending changes and assign them, from the dwarfwise menu, the proper military profession (and with it, the proper labors), and the proper squad. Remember—since we've already assigned the officers separately, we only have the remaining 18 dwarves to go through.

Step 8 Hit commit changes and admire your new dwarven military squads! The fun's not over, though, since you now have to go to the Dwarf Fortress military screen (`M`) and start assigning uniforms, schedules, and so on.

And there you have it!

Part V
Appendix

16 Hotkeys

Although the main functions that you'll be performing with the program have hotkeys, overall hotkey support is still quite limited.

Hotkey	Action	Refer To
Commands		
`Ctrl + C`	Connect to Dwarf Fortress	**"Connecting to Dwarf Fortress"**
`Ctrl + R`	Read Dwarves	**"Connecting to Dwarf Fortress"**
`Ctrl + T`	Commit	**"Managing Your Dwarves"**
`Ctrl + E`	Clear	**"Managing Your Dwarves"**
`Ctrl + S`	Snapshot	**"Menu Bar"**
`Ctrl + P`	Options	**"Options"**
Views (when the View is active)		
`Scroll`	Scroll Vertically	**"Labors View"**
`Alt + Scroll`	Scroll Horizontally	**"Labors View"**

Groups (when Groups are active)
Hit the key that corresponds with the first letter of the group's name to bring it up.
If there are multiple groups that begin with that letter, you can cycle between them using that key.

17 Modifying Game Data

`game_data.ini` is a .ini file packaged with Dwarf Therapist that describes standard settings for a number of things, divided between some RAM values, skill levels, position flags, profession IDs, attributes and attribute strings, military preferences, skill names, traits, dwarven job IDs, thoughts, and a very, very long list of role modifiers; if you're interested in the profession and job sort key, the master ID list is here. You can change these values (and therefore the program's behavior) yourself by modifying the document in any TXT editor to change the program's behavior. Be warned: messing with it can cause all sorts of strangeness and even crash the program on startup, and should you update Dwarf Therapist the changes you've made to this document will be lost. Since the default settings are fine for the most part (the happiness bonuses/penalties for certain thoughts are complete guesswork, but that's because they are unknown to anyone), you should only modify stuff here if you *really* know what you are doing.

There is also a `Dwarf_Therapist.ini` file which is placed in an appropriate folder on your computer on installation—in roaming data if you are on PC, for instance. This file contains all of your presets and custom definitions, and is separated from the rest of the installation so that when you update Dwarf Therapist to a new version, the settings, options, and custom code bits you had present in a previous version of the utility are still present. Deleting this file will revert the program back to base settings.

18 Packaged Exports

For packaged exports created by other users to use in Dwarf Therapist, see the repository at `http://dwarffortresswiki.org/index.php/Utility:Dwarf_Therapist/Addons_Repository`.