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**FIA Biosum**

**Bioregional Inventory Originated**

**Simulation Under Management**

**Installation Guide**

**For Version 5.8.9, released on 2 October 2020**

**Introduction**

This guide details the 32 steps required to install the FIA BioSum software on your Windows computer for the first time—what we call a “full installation”. Instructions for upgrading from a previous version of BioSum are provided in an [Appendix](#_Appendix:_How_to) at the end of this guide. BioSum should be installed from an account with administrative privileges. Some components, such as ORACLE Express Edition, must be installed from an administrative account. One benefit of installing all components from an “admin” account is that all components are then available to be run from any user account on the computer. It is also essential that BioSum “projects”, the datasets assembled and analyzed during the BioSum workflow, be in “trusted locations” as defined in the MS Access configuration to eliminate disk write failures in a project’s database.

If installing on a Forest Service computer, full administrative account access is not available. While most of the components can be installed using the <Run Elevated> option on the right click menu, paying strict attention to the instructions herein, the ORACLE XE software installation and User Account Controls modification can ONLY be accomplished with full administrative access. Users with computers on the Forest Service should refer to Appendix 2 for installing additional components allow BioSum to function without installing ORACLE XE. Forest Service users should skip steps 2-8 and NOT try to install and configure ORACLE XE or the FIADB Oracle Schema.

The full installation can be initiated from FIA\_BIOSUM\_SETUP.ZIP. Use your favorite archive program (e.g., 7-zip, WinZip) to extract this archive to C:\ -- this will create the folder C:\FIA\_BioSum and subfolders such as C:\FIA\_BioSum\Setup. After archive extraction, five critical installation tasks must be performed:

1. Install Oracle 11g Express Edition (XE), if not already installed (unless the computer is on the USFS network; If a USFS computer, refer to Appendix 2)
2. Install FIADB Oracle Schema, if not already installed (unless the computer is on the USFS network)
3. Install R, if not already installed on the computer (version 3.4 or better)
4. Install RODBC, if not already installed
5. Install FIA Biosum Manager—the analyst-friendly software that manages workflow associated with the many data manipulation and analysis procedures in a BioSum project.

If Oracle 11g XE (11.2.0) has already been installed via procedures consistent with those specified in this guide, there is no need to reinstall this component. Oracle 11g documentation is available in c:\ fia\_biosum\setup\oracle11g\_xe\oracle\_11g\_setup\_instructions.pdf after self-extraction of FIA\_BIOSUM\_SETUP, but if the installation is successful, it is typically not needed. User permissions on the USFS network prohibit the installation of Oracle 11g XE.

**Software Requirements for Computers Running BioSum**

For BioSum to install and function at all, requirements 1-2 must already be met. Requirement 3 can be met following installation.

1. Microsoft Windows 7 Professional, Enterprise, or Ultimate editions, or Windows 10.
2. Microsoft Office 2013 or greater (through Office 365), which BioSum uses for data storage, but **must be** 64-bit Version and include MS Access. IMPORTANT: If running Office 2016 or later the MS Office 2013 64-bit runtime library Access\_runtime\_**x64**\_en-us.exe) must also be installed (download via <https://www.microsoft.com/en-us/download/details.aspx?id=39358>), then install as admin or via Run Elevated (USFS users).
3. FVS Suppose v.2.02 or later (Separate Installation) <http://www.fs.fed.us/fmsc/fvs/software/complete.php>

**Setup Overview**

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| Faithfully (and patiently) following these instructions will get you up and running with BioSum soon. Because BioSum relies on ORACLE “packages” (code libraries) throughout the workflow, both ORACLE XE and the FIADB ORACLE “schema” that connects BioSum to the ORACLE packages **must** be installed for the software to function correctly. These installations require admin status on the computer. Because the Forest Service network prohibits admin status, Forest Service users should refer to Appendix 2 for an alternative to ORACLE.  Unless BioSum will be used only to create FVS files for purposes unrelated to BIOSUM analysis, the R software and RODBC driver must also be installed to enable OPCOST to estimate costs of forest operations. Install the FIA BIOSUM MANAGER last.  If ORACLE XE, R (32 bit, a.k.a. i386, version 3.4 or better) or RODBC are already installed on your computer, they do not need to be reinstalled. The fia\_biosum\_setup.zip archive file contains all the files needed for a full install. It is best to unzip this to the root directory of the C drive (specify C:\ as the location to install—the installed will then create folder named C:\fia\_biosum, with a setup folder, these installation instructions, and release notes). |

**RUN ELEVATED PRIVILEGES OVERVIEW (Forest Service users)**

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| To install or uninstall the software (via the .MSI file) requires administrative privileges. Forest Service users will typically be operating with a Forest Service computer with a standardized “imaged” operating system that does not grant the user admin privileges. For installation steps requiring administrative privileges there are 2 alternatives:   1. Right-click the install file (e.g., the msi) or command (e.g., odbcad32.exe) and select <Install Elevated> or <Run Elevated>, or 2. Shell to a command prompt by selecting locating (in File Explorer) and right-clicking on the file C:\Windows\SysWOW64\cmd.exe, then selecting <Run Elevated>. From the elevated command prompt, navigate to the folder location of the BIOSUM install files and run each of them from the elevated command prompt. This is the PREFERRED and only FULLY TESTED approach.   **<Install Elevated>** and **<Run Elevated>** are the Forest Service Powerbroker options that should be used for elements of the installation process requiring execution as an admin level user.  Running the BioSum software, once it has been successfully installed, does not require administrative privileges. By default, the BIOSUM software is installed for all user accounts.  If you intend to open and edit BIOSUM MS Access files, make sure that the directory location that houses a BioSum project (which consists of a great many Access database files) of the file is set as a trusted location in the Access software settings (under options, trust center settings).  The best way to make sure that installation components are installed under the admin privileges (non-Forest Service users) is to open a command window as admin and type the commands out in that command window. For example:  For step 9, you would follow these steps:  1. Start a command prompt with admin privileges.  2. In the command prompt type these commands:  2a. cd c:\ fia\_biosum\setup\Import\_FCS <enter key>  2b. Import\_FCS.bat <enter key>  When defining the ODBC entries make sure ODBCAD32.EXE is started from the c:\windows\System32 folder, as a user with admin privileges. Note that the System32 folder contains the 64-bit ODBC Data Source Administrator. |

**Setup Instructions**

1. Login to your computer as an administrator
2. **INSTALL Oracle 11g XE:** If your computer is on the Forest Service network, execute the steps in Appendix 2 before skipping to step 10. If Oracle 11g XE is already installed then skip to item 9. As an administrator, execute the file

c:\fia\_biosum\setup\oracle11g\_xe\DISK1\setup.exe.

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| 1. Click <Next> | 1. Check “Accept terms”,click <Next>. |
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| 1. Accept the default destination folder and click <Next>. | 1. Set the System Administrators password. Type the password admin and select <Next>. |
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| 1. Check the settings and proceed with the installation by selecting <Next>. | NOTE: Port settings should read as follows: Oracle Database Listener – 1521; Oracle Services for Transaction Server – 2030; Oracle HTTP Listener – 8080. | |
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| 1. If receiving these messages click <OK> and proceed with installation. If one or more error messages such as the one displayed below appear, clear them by clicking OK to ignore them. Then click <Finish> to complete the installation. | | |
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1. **Install** **FIADB Oracle Schema:**
   1. Start the command prompt with administrative privileges
   2. At the command prompt type **cd c:\ fia\_biosum\setup\Import\_FCS\_BioSum** and the <enter> key (case does not matter when typing these commands at the command line prompt).
   3. At the c:\fia\_biosum\setup\Import\_FCS> command prompt type **.\FCS\_BioSum\_Import.bat** and the <enter>.

**Note**

It is ESSENTIAL that all of the following files be in the Import\_FCS\_BioSum directory BEFORE running the FCS\_BioSum\_Import.bat file (as admin):

1. FCS\_BIOSUM.DMP (dated 5/25/2018)

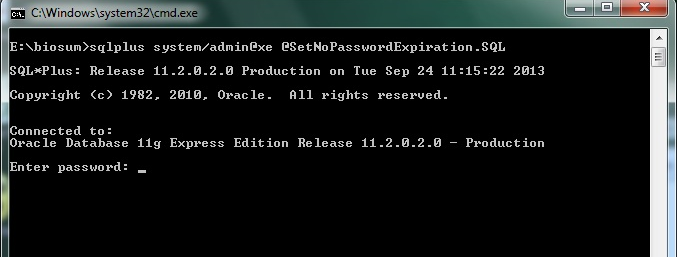
2. FCS\_BIOSUM\_impdp.DAT

3. FCS\_BIOSUM\_Import.bat

4. FCS\_BIOSUM\_SetNoPasswordExpiration.SQL

5. FCS\_BIOSUM\_TryDropUserCmd.SQL

If prompted for the password type in **fcs** (for this purpose, **case matters**—these are lower case letters) and press <enter>. (**IMPORTANT!** - the text will not appear as you type, nor will the cursor move. Don't type in any extraneous characters). See below.



Many lines of processing will scroll up the screen; when finished, you may see a “3”. Press <enter>, then “quit” to exit the ORACLEXE environment.

**Tips for troubleshooting the Oracle FCS Schema**

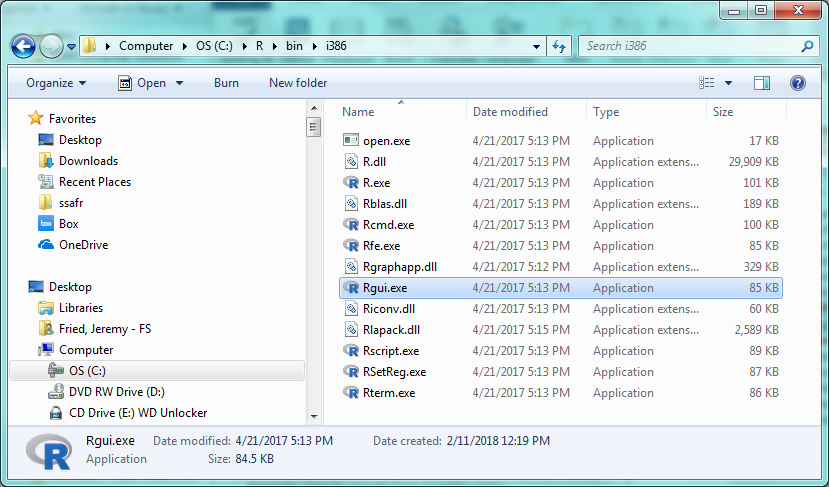
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| If a previous FCS schema is already installed on your computer or if the setup of the schema failed, follow these steps:   1. Navigate to the C:\oraclexe\app\oracle\admin\XE\dpdump folder 2. Delete all files 3. Repeat step 9   If the FIA BIOSUM MANAGER application fails to connect to the Oracle FCS services, follow these steps:   1. Start a command prompt with <Run Elevated>. 2. Open the **sqlnet.ora** file in a text editor (such as notepad). It is located in the folder: C:\oraclexe\app\oracle\product\11.2.0\server\network\ADMIN 3. Edit this file so that it reads as below   FROM  SQLNET.AUTHENTICATION\_SERVICES = (NTS)  TO  SQLNET.AUTHENTICATION\_SERVICES = (NONE)   1. Save the file. 2. Logout of the admin account on your computer, login with your regular userid and test |

**Install R:** If R is already installed then skip to step #19; otherwise, navigate to the c:\fia\_biosum\setup\R folder and run the file R-3.4.0-win.exe, with admin privileges.

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| 1. Click <OK>. | 1. Click <Next>. |
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| 1. Click <Next>. | 1. By default, R will install in the <Program Files> folder. Click <Browse> to navigate elsewhere, if desired (e.g., C:\R, as shown). |
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| 1. Accept the defaults and click <Next>. | 1. Accept the defaults and click <Next>. |
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| 1. Accept the defaults and click <Next>. | 1. Accept the defaults and click <Next>. |
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| 1. Click <Finish>. | |
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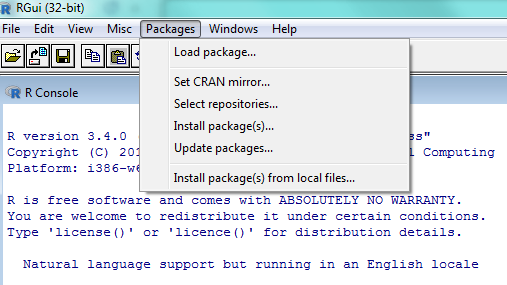
1. **Install RODBC:** If RODBC is already installed then skip to step #24. RODBC enables R to connect to MS Access tables using ODBC. Navigate to the folder containing the R i386 program called RGui.exe and open it. NOTE: An internet connection is required for the RODBC install.



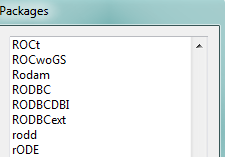
1. Click on <Packages> <Set CRAN mirror>, and choose a mirror location near you.

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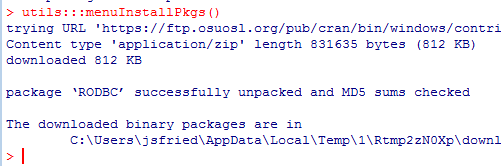
1. Then, click again on <Packages> but this time select <Install Packages>.



1. Select the <RODBC> package to download and install. Click <OK>.



1. Check to see if successfully installed.



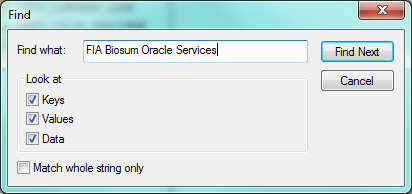
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| 1. **Install FIA Biosum Manager:** Navigate to the c:\ fia\_biosum\setup\FIA Biosum Manager folder. Open the file ‘fia\_biosum\_setup\_versionnumber.msi via right click, Install. Click on <Next>. | |
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| 1. **Create ODBC connection**: If your computer is on the Forest Service network, skip this step and proceed to step 27. Otherwise, navigate to the c:\windows\system32 folder and run odbcad32.exe as an administrator. Click System DSN tab, and select <Add> to add data source | |
| * 1. Choose the System DSN tab, and select <Add> to initiate adding a data source | * 1. Select ORACLE in XE as the data source driver |
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| * 1. Enter the connection information exactly as it appears below | * 1. Then click <Test Connection> to ensure that the service works as intended, **THEN** <OK> |
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| * 1. Enter TNS Service name: XE, User ID: fcs\_biosum and password: fcs, then click <OK>. | * 1. A “Connection Successful” result is validation of a working ORACLE connection. |
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| If the test connection fails, check to see if the Oracle XE services are running. In the task bar on the desktop, select <Start> right click <My Computer> and select <Manage>. On the computer management form select <Services and Applications><Services> and check to see if <OracleServiceXE> is started and <OracleXETNSListener> is started. To start either of the Oracle XE services, right-click on the service and select <Start>. Test the ODBC connection again. If the connection fails a second time then contact FIA BIOSUM support staff for assistance. | |

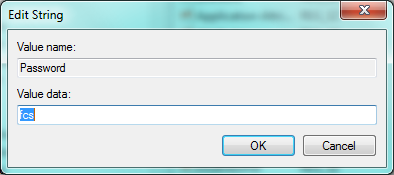
1. **ODBC Registry Edit:** Add the ODBC Oracle fcs password. Adding the fcs password to the registry will prevent the user from being prompted for the password each time BIOSUM requests access to the fcs->BIOSUM\_VOLUME table.

In the task bar on the desktop, select <Start>. Type in the text box ‘regedit’ and press <enter>.

In the registry editor form, select <Edit><Find> and enter the search information displayed below and select <Find Next>.



When the search finds the ODBC DSN string, double click on the <Password> value and in the text box type ‘fcs’, then click <OK>.



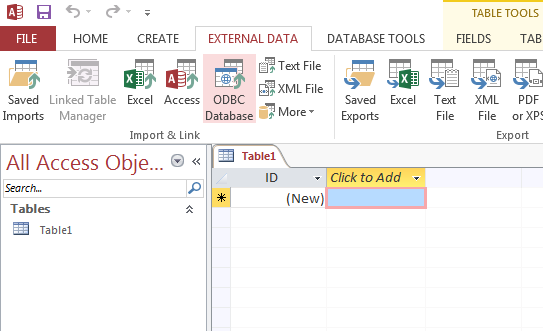
1. If running Access 2016, Office 365 or any other version later than 2013, you will need to install the **MS Office 2013 64-bit runtime library** Access\_runtime\_x64\_en-us.exe. This can be downloaded via https://www.microsoft.com/en-us/download/details.aspx?id=39358, and must be installed with elevated or admin privileges.
2. Path Statement modification (essential if there are other versions of ORACLE installed). Forest service users can skip this step because they are not using ORACLE.

Setting the PATH variable in the command prompt only exists for the life of the command prompt. To permanently set the PATH variable follow these steps:

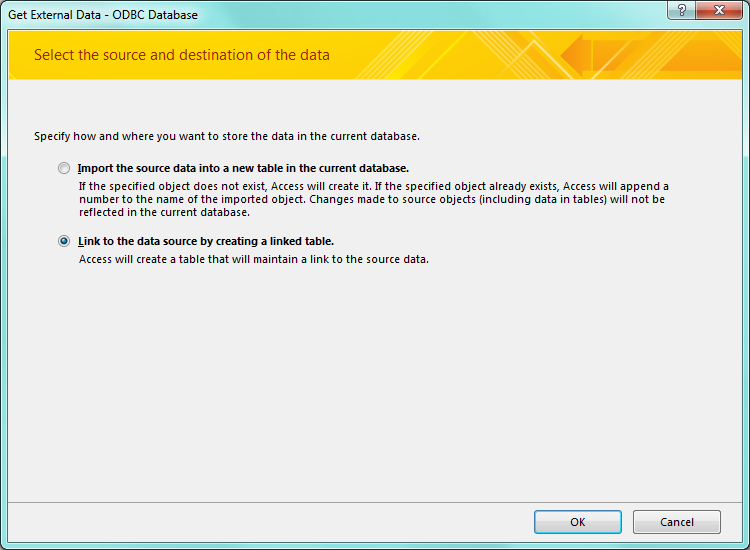
* 1. Run a command prompt (CMD.EXE) with admin access
  2. Type sysdm.cpl <Enter>
  3. Click the <Advanced> tab
  4. Click the button <Environment Variables>
  5. Find the PATH variable in the bottom ‘System’ list
  6. If the ORACLEXE path isn’t in first position, move it there as shown below

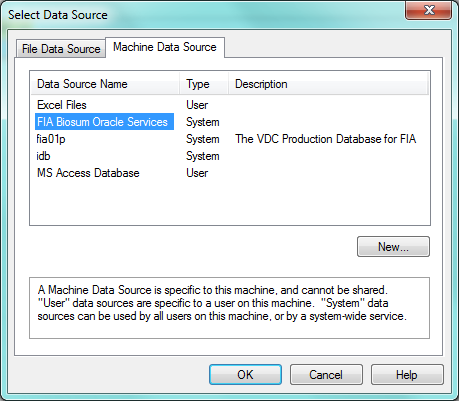
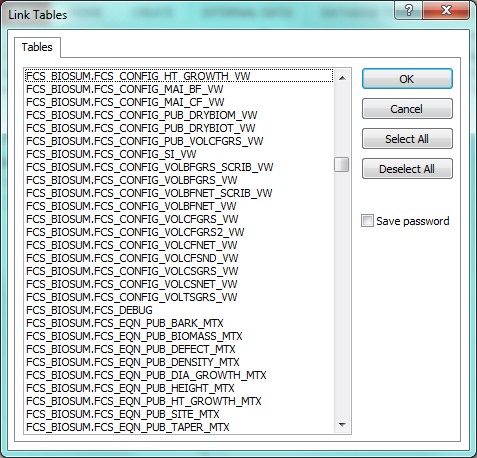
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1. **Additional (optional) ODBC connection test for non-Forest Service users:**
2. Open any MDB or ACCDB file, select the <External Data> tab and choose <ODBC Database>.



1. Select <Link to the data source by creating a linked table> and then click <OK>.



1. Select <Machine Data Source> tab, <FIA Biosum Oracle Services> and <OK>  
     
   
2. If ODBC is successful, then the tables in the FCS oracle schema will be listed, as below. If there is an ODBC connection problem, Biosum support staff can assist.   
     
   

**Setting up BioSum Manager**, and **testing the ODBC connection** from BioSum

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| 1. Start BioSum Manager and select the Settings menu |
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| 1. Navigate to the directory containing Rscript.exe on your computer. Be sure to select the 64 bit version of Rscript, which is stored in the x64 folder within your R version bin folder. Also navigate to and select the OpCost script file (10\_1\_5.R as of this version of BioSum); it can be found in the C:\Program Files\FIA PNW Portland Forestry Sciences Lab\FIA Biosum 5.8.9\opcost\ folder. Then click <Save> to save these choices, then <OK> to close the Settings window. |
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| 1. Start the BioSum Troubleshooter tool |
| 1. Click the <Calculate Volume and Biomass> button |
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| 1. If numbers show up in the results table, typically after 10 to 20 seconds, all is well with the ODBC connection. The tool can be closed by clicking the close (x) button in the upper right corner of the dialog. If errors or no results, the ODBC connection issue needs resolution before BioSum can operate correctly. |
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# Appendix 1: Upgrading the BioSum software from an earlier version

**Upgrade Overview**

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| Most BioSum upgrades can be installed by simply installing the .msi file provided (in this case, fia\_biosum\_setup\_588.msi). This will install a new BioSum version, and that version will appear as a new menu entry under FIA BioSum in the Windows Start Menu. Old versions can be deleted later, if desired (via Control panel, Programs and Features).  However, some upgrades, such as 5.8.0, are so substantial that they also include changes to the FIADB ORACLE schema, so a new schema must also be loaded. Moreover, since version 5.7.6, backward compatibility has been maintained via the “stairstep model” such that a 5.7.6 project would have to be upgraded first to 5.7.7 (by opening the project in 5.7.7), then saved and BioSum closed, then a repeat of this process (open, save, close) in the same version (5.7.7 in this example) before opening the project in 5.7.8 (to upgrade it to that version), and so on. Opening a 5.7.6 project directly into 5.8.0 would lead to considerable manual effort in the way of copying and querying tables and databases to get the project working in 5.8.0—this is not advised. It is possible to see the last version of BioSum that was used to open a project by opening and reading the one line text file application.version in the project root directory. If you have pre-5.8.0 BioSum projects that will need to be upgraded, please consult the BioSum support staff for assistance and access to pre-5.8.0 versions of the software to make the stairstep journey.  If you DON’T have projects needing to be upgraded but DO have BioSum 5.8.0 or higher installed on your computer, follow steps 9, 24 and 25 and you should have a fully functional version of BioSum ready to go. Remember to use an admin account (at least on a FS imaged computer—other environments have been less tested). On a Forest Service computer, admin status sufficient to perform steps 9 (load the DMP file), 24 (install the msi) and 25 (establish and test the ORACLEXE connection) as Run Elevated (a PowerBroker feature). It may be necessary to repeat Step 26 also (in admin status), entering the fcs password in the registry. If the password is missing from the registry, workflows in BioSum that rely on the ORACLE connection will often “hang”, waiting for a password, and sometimes the password entry window will not be accessible even if you are willing to respond to it.  Since 5.8.6, BioSum has required that Microsoft Access Runtime 2013 be installed if using Office 2016 or greater (including Office 365). If you were previously running an earlier version of Office but have upgraded, you will need to make sure this runtime is installed—you can check for it in the programs and features uninstall list, accessible via control panel, to make sure it is available.    Finally, if you have an earlier build of release 5.8.8 installed, you will need to uninstall it before installing this build (January 21, 2020). |

# Appendix 2: Additional steps when installing BioSum on Forest Service computers

Users with computers on the Forest Service network should execute the following steps to allow BioSum to connect with an internal, central Oracle database hosting the ANL\_PNW\_FIA\_FCS schema:

1. Permissions for the ANL\_PNW\_FIA\_FCS schema must be granted before you can connect to it. Request access from <insert contact info here>.
2. If it is not already installed, install the 64-bit Oracle 12c client from the FS Software Center. Accept the default values as you click through the installation dialog.
3. Navigate to the c:\windows\system32 folder and run odbcad32.exe.
   * Click the User DSN tab, and select <Add> to add a data source.
   * Select ‘Oracle in OraClient’ as the data source driver
   * Enter the connection information exactly as it appears below:
     + DSN=FIADB01P
     + TNS Service Name=FIADB01P
     + User name=user name associated with the permissions granted in step 1
   * Then click <Test Connection> to ensure that the service works as intended. Use the user name and password provided to you during step 1. The test connection will not work if step 1 has not been completed.
   * Click <OK> to finish creating the datasource
4. Copy the following 3 files from C:\Program Files\FIA PNW Portland Forestry Sciences Lab\FIA Biosum 5.8.9\fcs to your Windows AppData folder. If you don’t know the location of the AppData folder, launch BioSum and click on the <Settings> menu. The path to the AppData folder appears on this screen.
   * BioSumComps.jar
   * fcs\_tree.db
   * fcs\_tree\_calc.bat
5. If multiple users share a computer, steps 3 and 4 will need to be completed by each user.