



Interreg Alpine Space project - **NEWFOR**

Project number 2-3-2-FR

NEW technologies for a better mountain **FOR**est timber mobilization

Priority axis 2 - Accessibility and Connectivity

Workpackage: Costs and benefits – WP 7

English Glossary for Estimating the Costs of Cable Crane Operations with “HeProMo”, the Wood Harvesting Productivity Model from WSL

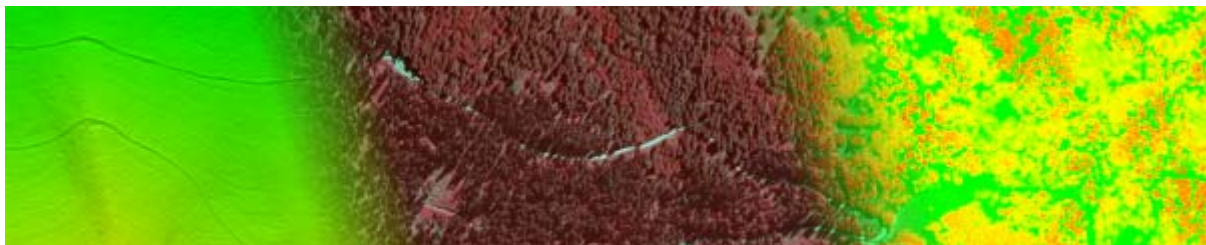
Coordinator: Nikolaus NEMESTOTHY, (BFW)

Contributors: Oliver CZWIERTNIA (BFW), Fritz FRUTIG (WSL), Oliver THEES (WSL)

Final version

03/April/2014

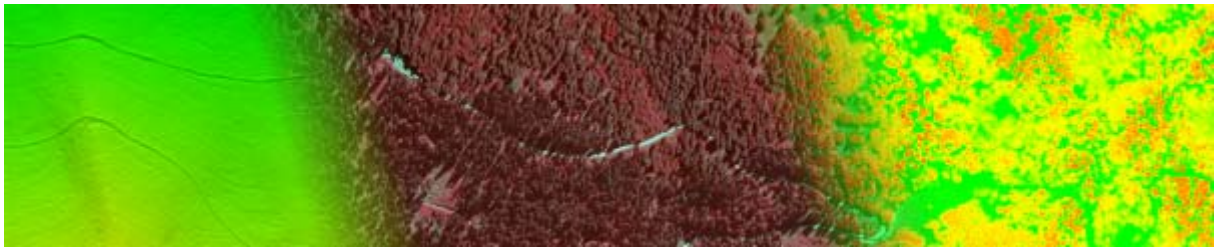




The consortium of the project Interreg Alpine Space NEWFOR

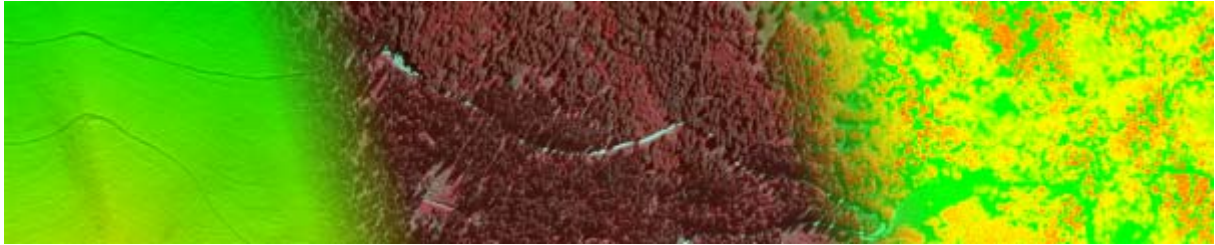


This project has been, co-funded by the European Regional Development Funds, and achieved under the third call of the European Territorial Cooperation Alpine Space Programme 2007-2013.



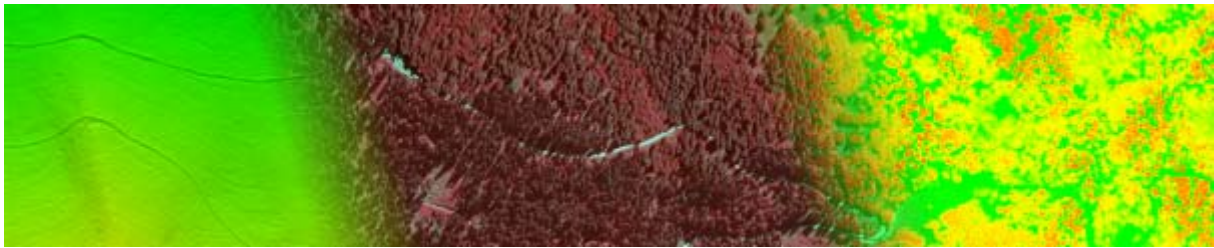
CONTENTS

Contents	3
1 Abstract	4
2 A synthetic overview of the interreg alpine space project newfor	5
2.1 The context	5
2.2 Objectives of the project	5
3 WP 7 - Costs and benefits evaluation	7
3.1 HeProMo – Harvesting Productivity Model	7
3.1.1 General Description -usability of the tool	7
3.1.1.1 english glossary for “hepromo”	8



1 ABSTRACT

With the “HeProMo” computer model the time and cost for the motor manual harvesting can be calculated. It is possible to calculate the time and the cost of each timber shock. The control of the software was given only in German language. For international user, a translation in the form of an English Glossary was made.



2 A SYNTHETIC OVERVIEW OF THE INTERREG ALPINE SPACE PROJECT NEWFOR

2.1 THE CONTEXT

Although forests represent a key resource of mountain environments, their valorization is hampered by accessibility constraints that prevent an efficient mapping, management, harvesting and transport of wood products.

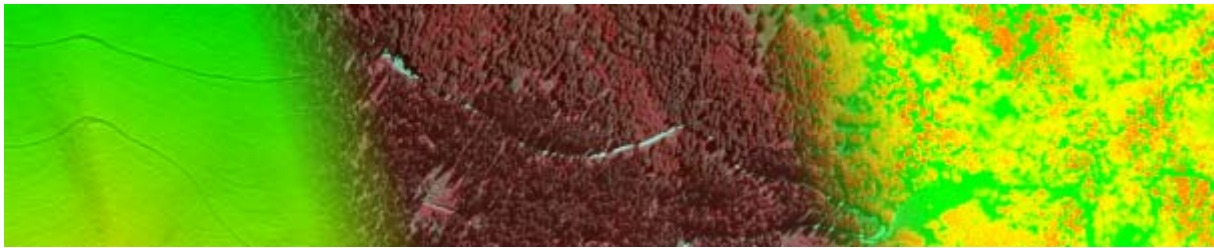
Forests fulfil multiple functions in mountainous areas. They have an ecological function as host of many habitats and species. They also are a leisure area for social activities such as hiking, skiing... From the economical perspective, the production of renewable resources like timber and fuelwood has positive effects both at global scale, with climate change mitigation, and local scale with rural employment and the development of a regional value chain. The objective of preserving and improving the development of mountain forests is a point of public interest. However, managing forests in mountain territories is a difficult task as topography and climate set strong constraints inside a complex socio-economical framework.

In particular, a precise mapping of forest biomass characteristics and mobilization conditions (harvesting and accessibility) is a prerequisite for the implementation of an efficient supply chain for the wood industry. The available information is currently insufficient to provide, at reasonable costs, the required guarantees on the wood supply and on its sustainability. With the recent development of new remote sensing technologies and modelling tools, major improvements regarding the evaluation of the forest growing stock and accessibility are now possible. Upon this highly valuable information, decision-making tools must be build to optimize the investments in forest infrastructures required for a cost-effective wood supply while securing the sustainable management of forests, and to support the implementation of an efficient European policy for mountain forest management.

2.2 OBJECTIVES OF THE PROJECT

According to this context and based on the use of new technologies (LiDAR: light detection and ranging, Unmanned Aerial Vehicle,...) for forest and topography characterization, the project NEWFOR is dedicated to enhance and develop tools and adapted policies for decision making in the field of a sustainable and adaptive mountain forest resources management facing the sustainability of mountain forest ecosystems services.

So, the main objective of the NEWFOR project is the improvement of mountain forest accessibility for a better economical efficiency of wood harvesting and transport in a context of sustainable forest management and wood industry in changing climate.



The 14 partners involved in the project consortium tackle this objective within five thematic workpackages (wp):

- Forest resources and LiDAR

Recent developments in LiDAR technology, combined to other available data sources (aerial photographs, aerial photo series by UAVs, ...), are now allowing a precise and fine mountain forest resource quantification, qualification and mapping. Integrating this technology will provide an innovative response to the challenges of a precise and robust knowledge on the available growing stocks. The project aims at testing and developing tools that will help forestry end-users to benefit from this technological advance.

- Forest accessibility

After the identification of forest resources, the second step of an efficient forest management is to evaluate the accessibility to these resources. In mountain areas, topography is the main constraint to a technical and economically efficient exploitation. The project demonstrated how to use topographic LiDAR data coupled with geographic information systems (GIS) for an optimal planning of forest harvesting and logging while taking current and scheduled accessibility of forest resources into account.

- Forest and industry connectivity

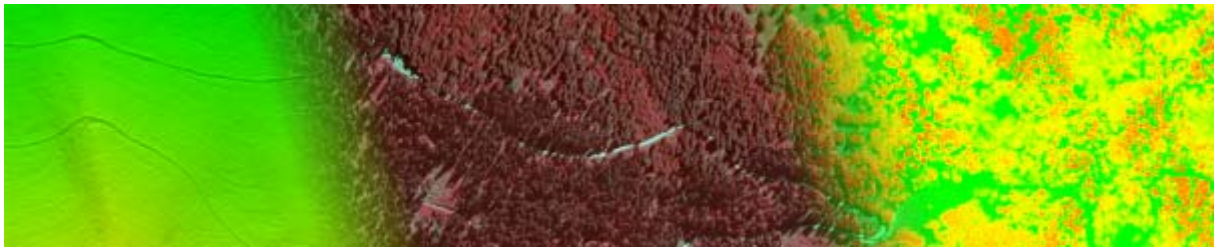
Once the forest resources and accessibility are characterized, then remains the issue of the connectivity between wood piles in the forests and wood yard of mills. This link is often neglected but is crucial for a comprehensive assessment of the wood supply efficiency.

- Costs and benefits evaluation

NEWFOR aims at developing decision-making tools dedicated to the definition of strategies for sustainable mountain wood supply chain. To fulfil this objective, tools for identifying forest resources, their accessibility and connectivity to the wood market are first considered separately. In order to achieve the demarche, and to choose the optimal strategy, it is necessary to evaluate the whole workflow from the economical aspect by comparing the costs and benefits of each possible strategy.

- Logistical planning strategy

There is a need to frequently adjust the planning of forest management to new economical evidence as well as to unforeseeable developments. Such an adaptive management needs to balance ecological, social and economic factors. The final objective was to provide forest managers and decision makers with reliable information for the evaluation of technical and economical conditions for their decision-making on timber supply chain logistical planning and land use strategies.



3 WP 7 - COSTS AND BENEFITS EVALUATION

3.1 HEPROMO – HARVESTING PRODUCTIVITY MODEL

3.1.1 GENERAL DESCRIPTION -USABILITY OF THE TOOL

The timber harvesting productivity model “HeProMo” is used to calculate the need of time and costs of different harvesting operations. The modular construction allows both the calculation of individual works or entire work chains.

"HeProMo" is a computerized internet based model for the calculation of the time and cost of the main timber harvesting operations and individual harvesting chains. It is aimed at forestry companies, loggers, forestry administrations and training institutes as well as developers of software for forestry applications.

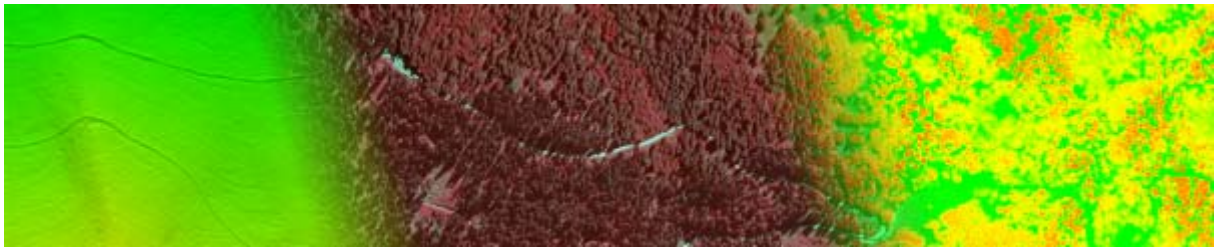
With "HeProMo" pre-calculations could be performed and variants could be tested. For this reason it is also suitable for the derivation of standard local fees, e.g. as a basis for forest services agreements.

"HeProMo" helps entrepreneurs to create quotes and allows forest companies and forest owners to check entrepreneur offers critical.

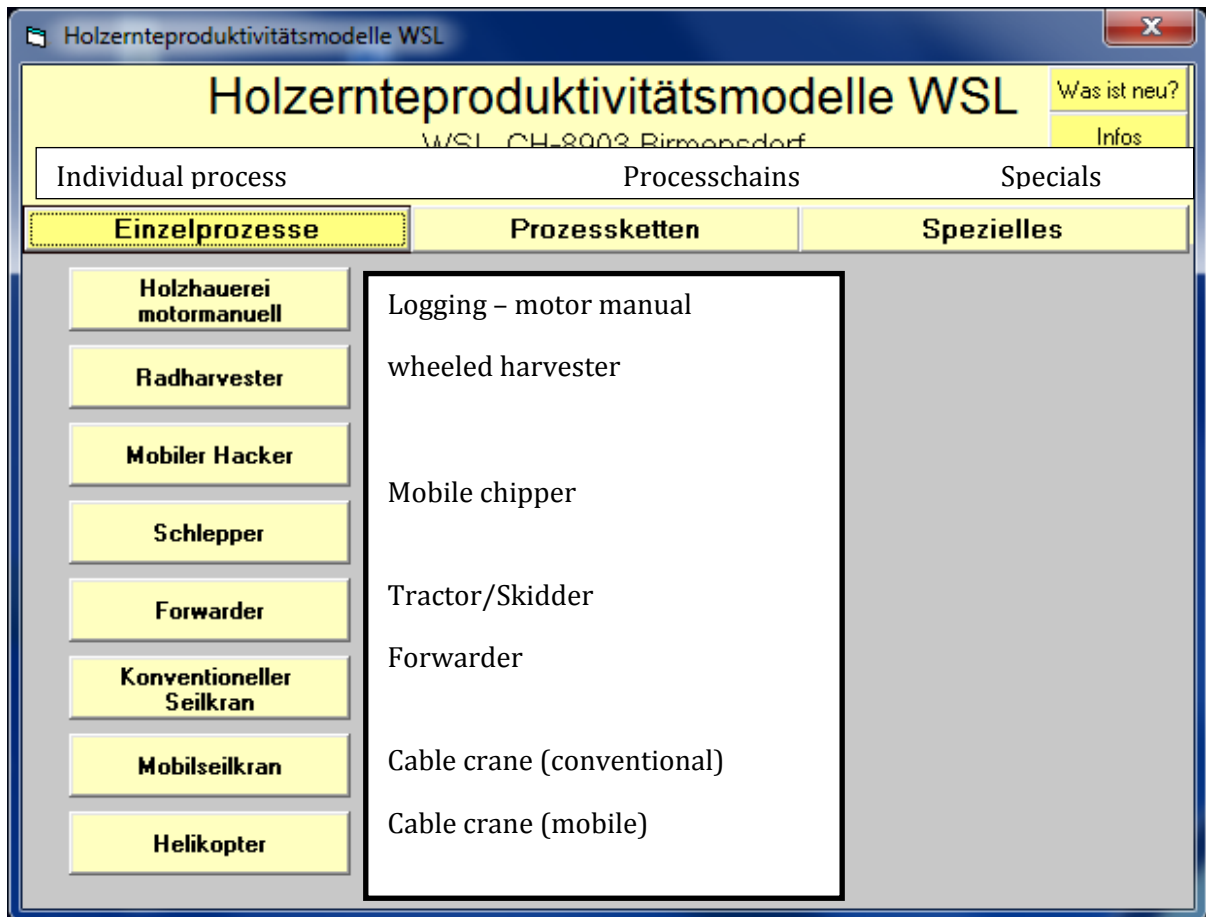
By means of sensitivity analysis, it is possible to estimate the influence of individual input variables on the outcome.

"HeProMo" is also ideal for education and training and for use in schools and courses. With its modules, it also supports the re-use in other applications such as simulation models and information systems.

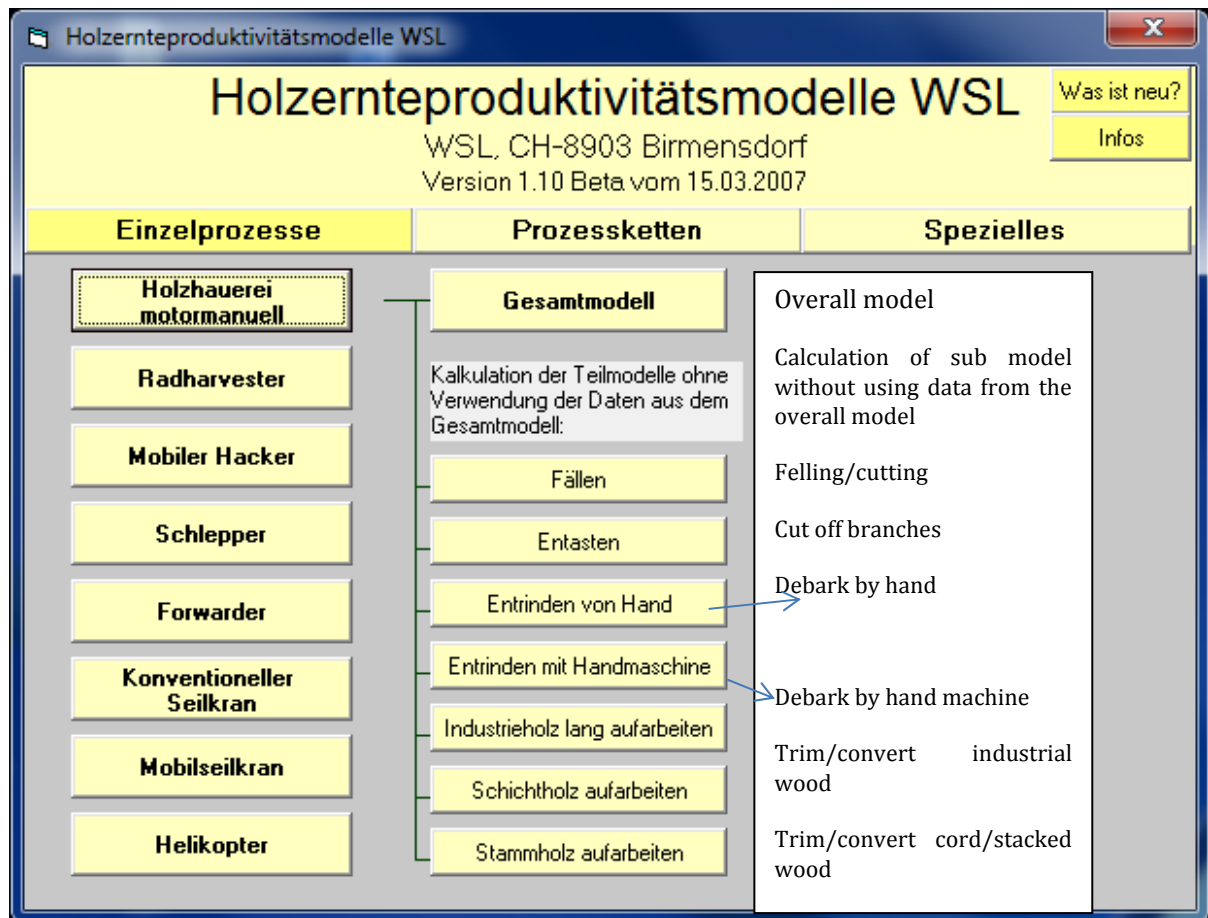
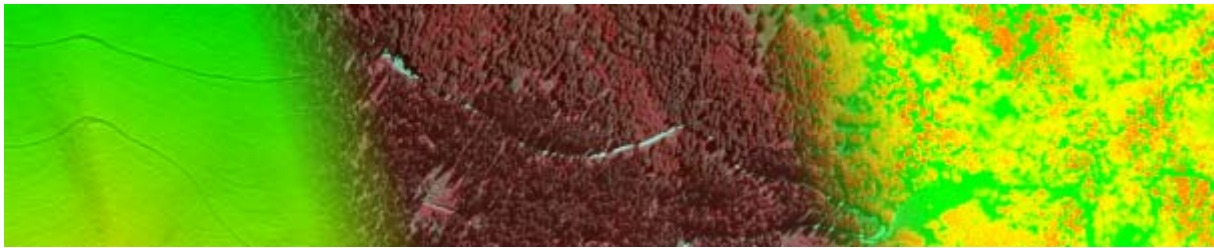
"HeProMo" was developed as part of the WSL research program "Management of sustainable forest management" and is a Windows software (up from Win 95) with user-friendly menu navigation. Available to the model are a ReadMe file with information on installation and use, so as also comprehensive documentation and user help for the individual models of "HeProMo".



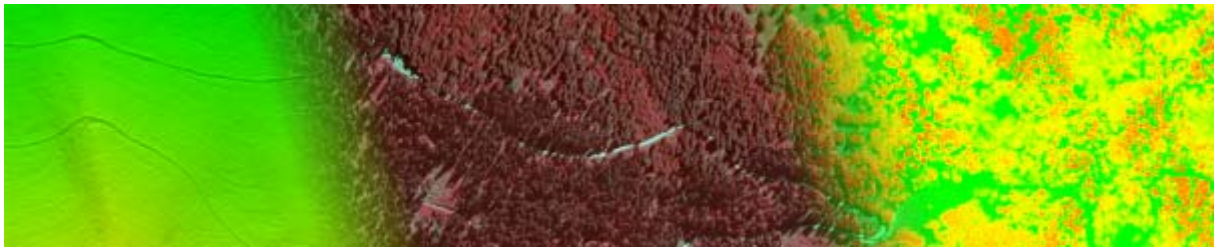
3.1.1.1 ENGLISH GLOSSARY FOR “HEPROMO”



Now Press „Holzhauerei motormanuell“



Now Press „Gesamtmodell“



HolzHauereiMotorManuell - Kostenkalkulation

Location: **Arbeitsort** | **Syste** | **Other paramete** | Beispiel Holzhauserei motormanuell 1

Work: **Arbeitsobjekt** | Arbeitssystem | Faktoren

Foreststand: **Bestand**

Amount of wood: Holzmenge (m3 i.R.) 150
Massenmittelstamm (m3 i.R.) 0,3

Average stem: Anteil Fällen mit Handseilzug (%) 0
Anteil Entrinden von Hand (%) 0

% of felling with hand cable: Baumartengruppe Fichte
Kronenlängenklasse Fichte

% debark by: Gelände
Hangneigung 0 - 30%
Hindernisse keine

Sortimentsvorgaben:

Mengenanteile (%)

Stammholz 100

Industrieholz lang 0

Schichtholz 0

AnteilSpalten (z.B. 30%=0.3) 0

Stuecklaengen

Stammholz 6 - 10m

Kanten brechen ☐

Industrieholz lang über 7m

Schichtholz 2m

Assortment criteria:

Amount %

Stemwood

Industrial wood

cord/stacked wood

share in % split wood

Lenght per piece

Ergebnis (in Rinde)

Zeitaufwand (Std)

Personal 144,92 WPPH

Motorsäge 71,5 PMH15

Schälseisen 0, PMH15

Umsetzen 0

Weitere Aufwände 0

Total

Kosten (SFr.)

pro m3 total

53,14 7970,71

6,67 1001,05

0,00 0,00

0,00 0

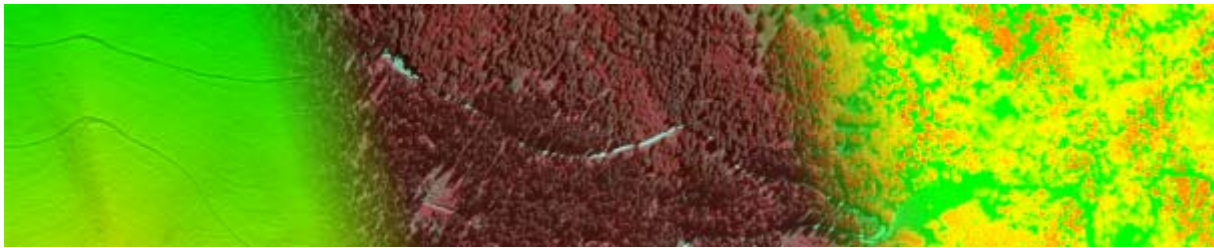
0,00 0

59,81 8971,77

☒ Fehlerliste zeigen

Eingaben speichern | Datenblatt | Info/Hilfe | Drucken

See next page



HolzHauereiMotorManuell - Kostenkalkulation

Arbeitsort: Beispiel Holzhauserei motormanuell 1

Arbeitsobjekt | Arbeitssystem | Faktoren

Bestand

Holzmenge (m3 i.R.) 150
 Massenmittelstamm (m3 i.R.) 0,3
 Anteil Fällen mit Handseilzug (%) 0
 Anteil Entrinden von Hand (%) 0
 Baumartengruppe Fichte
 Kronenlängenklasse < 33%

Sortimentsvorgaben

Mengenanteile (%)
 Stammholz 100
 Industrieholz lang 0
 Schichtholz 0
 Anteil Spalten (z.B. 30%=0.3) 0
 Stuecklaengen Stammholz 6 - 10m
 Kanten brechen
 Industrieholz lang über 7m
 Schichtholz 2m

Gelände

Hangneigung 0 - 30%
 Hindernisse keine

Ergebnis (in Rinde)

keine
 gering
 mässig
 stark

Kosten (SFr.)

pro m3	total
53,14	7970,71
6,67	1001,05
0,00	0,00
0,00	0
0,00	0
59,81	8971,77

Time expenditure per h

Chainsaw
 Spud (barking)
 Change class/transform

Personal

Motorsäge
 Schälseisen
 Umsetzen
 Weitere Aufwände
 Total

Result

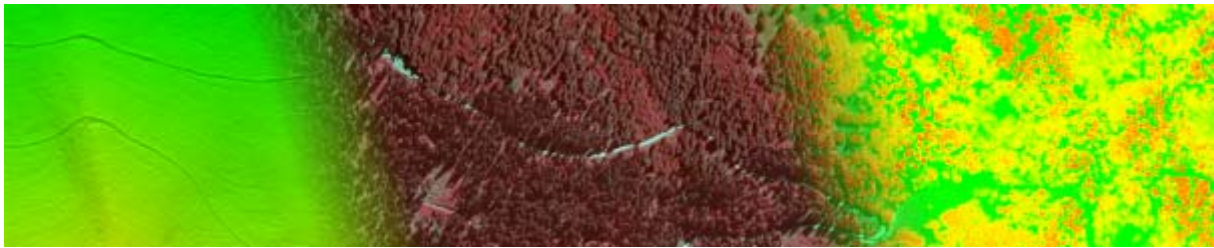
Intense
 Some
 Minor
 Non
 Handicaps/balk
 Gradient
 Terrain

☒ Fehlerliste zeigen

Eingaben speichern

Datenblatt Info/Hilfe Drucken

Show errors SAVE DATASHEET HELP PRINT Costs



HolzHauereiMotorManuell - Kostenkalkulation

Arbeitsort: Beispiel Holzhauserei motormanuell 1

Arbeitsobjekt: Arbeitssystem Faktoren

Kostenansätze

Personal	55,00	SFr./Std.
Motorsäge	14,00	SFr./BStd.
Schäleisen	0,50	SFr./BStd.

Bezahlte Arbeitswege und Pausen

Tägliche Arbeitszeit (Min.): 540

davon bezahlte Wegzeiten u. Pausen (Min.): 60

	SFr.	Std.
Umsetzen	0	0
Weitere Aufwände	0	0

Ergebnis - (in Rinde)

	Zeitaufwand (Std)		Kosten (SFr.)	
Personal	144,92	WPPH	53,14	total 7970,71
Motorsäge	71,5	PMH15	6,67	1001,05
Schäleisen	0	PMH15	0,00	0,00
Umsetzen	0		0,00	0
Weitere Aufwände	0		0,00	0
Total			59,81	8971,77

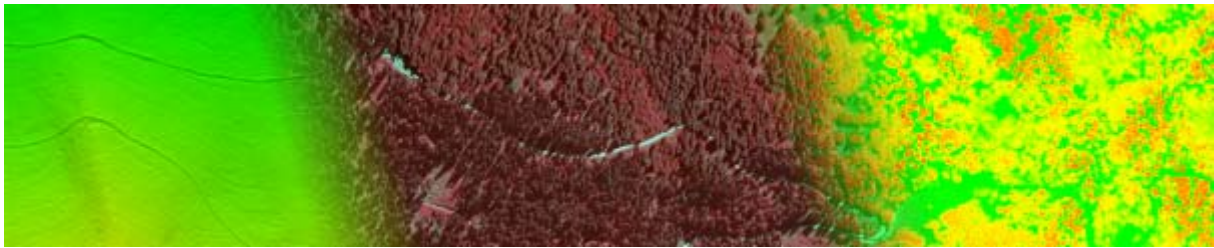
☒ Fehlerliste zeigen

Eingaben speichern Datenblatt Info/Hilfe Drucken

Costs:
Personnel
Chainsaw
Spud (barking)
Operating hour

Paid duty stroke/Break
Daily hours of work
Of which Paid duty stroke/Break
Change of class/transform
Others

See page 11



HolzHauereiMotorManuell - Kostenkalkulation

Arbeitsort: Beispiel Holzhauserei motormanuell 1

Arbeitsobjekt: Arbeitssystem: **Faktoren**

Risiko, Verwaltung, Gewinn (%) 0 Währungskürzel SFr.

Weitere Faktoren

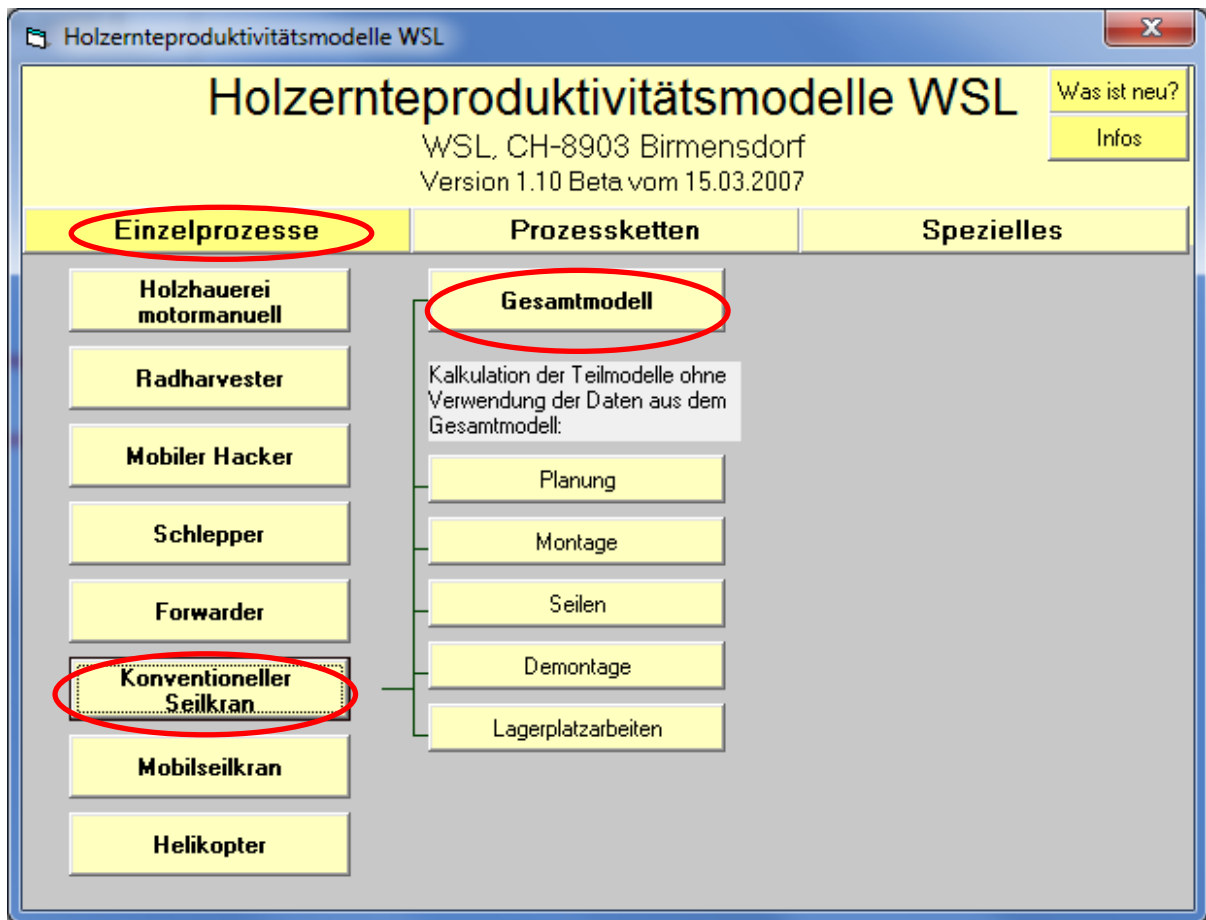
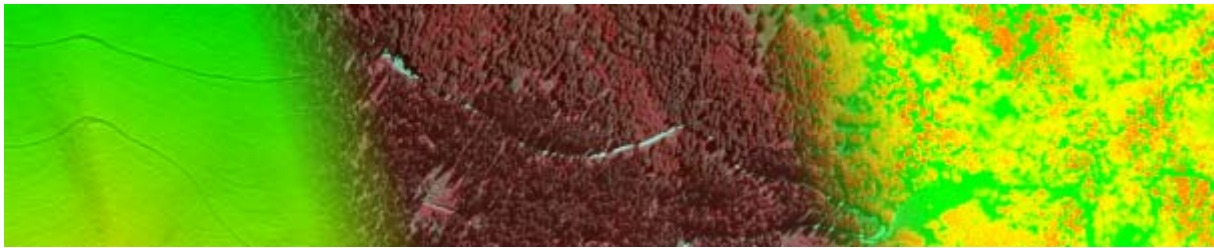
Risk, abministration/management, profit

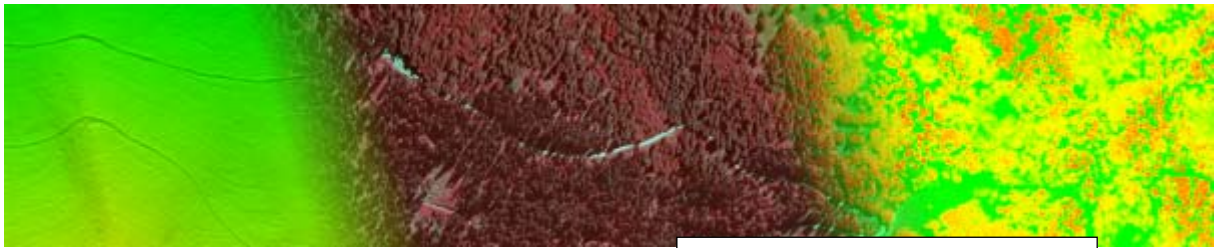
Ergebnis (in Rinde)

	Zeitaufwand (Std)		Kosten (SFr.)	
			pro m3	total
Personal	<input type="text"/> 144,92	WPPH	<input type="text"/> 53,14	<input type="text"/> 7970,71
Motorsäge	<input type="text"/> 71,5	PMH15	<input type="text"/> 6,67	<input type="text"/> 1001,05
Schälseisen	<input type="text"/> 0	PMH15	<input type="text"/> 0,00	<input type="text"/> 0,00
Umsetzen	<input type="text"/> 0		<input type="text"/> 0,00	<input type="text"/> 0
Weitere Aufwände	<input type="text"/> 0		<input type="text"/> 0,00	<input type="text"/> 0
Total			<input type="text"/> 59,81	<input type="text"/> 8971,77

☒ Fehlerliste zeigen

See page 11





Konventioneller Seilkran - Kostenkalkulation

Arbeitsort:

Arbeitsystem | Faktoren

Forest stand/stock: **Arbeitsystem**

Average piece volume: 0,4 800

Amount of wood at each cable line: 5

Piece length: 50

Terrain: **Cable**

Gradient: 800

Mark line without project: bergab

Length of line: 350

Direction between: bergab=downhill or bergauf=uphill

Average distance on the skyline: 20

Average distance of lateral transportation: 200

Montage/fitting/const ruction: 200

Demounting: 200

Chage of line (if checked see next page for choices):

Wood cable transport from: [Choose between: aus Schlagfleache = from place of logging; abHaufen =

Choose type of operation: Durchforstung

Thinning

Clearance

Final-/Regeneration

Handicaps/bal k [choose between: Normal, erschwert=hindered; and extreme]

Amount

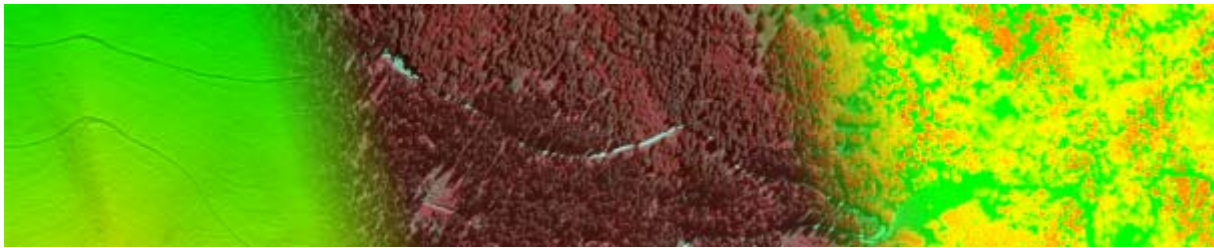
Height of skyline

Stock/stand

Depot/camp

Intermediate

See nextpage!



Konventioneller Seilkran - Kostenkalkulation

Arbeitsort: Beispiel Konventioneller Seilkran 1

Arbeitsobjekt | Arbeitssystem | Faktoren

Bestand

Mittleres Stückvolumen (m3): 0,4
 Holzmenge an der Seillinie (m3): 800
 Stücklänge (m): 5

Eingriffsart: Durchforstung
 Holz wird geseilt ...: aus Schlagflaeche

Gelände

Hangneigung (%): 50
 Hindernisse: normal

SeilLinie

Linie abstecken ohne Projekt: ☒
 Länge (m): 800
 Richtung: bergab
 Fahrtdistanz (m): 350
 Distanz seitlicher Zuzug (m): 20

Anzahl
 Stützen: 2
 Endmasten: 1

Tragseilhoehe (m)
 Bestand: 12
 Lagerplatz: 10

Windenttransportart: kein Windenttransport
 Windenstandort: bleibt
 Distanz Winden-selbstfahrt (m): 200

Seilverlegung: ☒
 Seilverlegung: ☒
 Selbstfahrt bergauf
 Selbstfahrt bergab
 mit Heli

Kosten (SFr.)	
pro m3	total
149,16	WPSH
583,62	WPPH
96,05	PMH15
81,41	PMH15
0	
0	
56,67	45335,61

Produktivität Seilen: 8,33 m3/PSH15

Arbeitsliste zeigen

Eingaben speichern | Datenblatt | Info/Hilfe | Drucken

Choose kind of winchtransport

No winch transport

Self-propelled uphill

Self-propelled downhill

With chopper

Results

Duration of Work

Personnel

Cable crane

Cranevehicle

Move Cranevehicle

Other expenditures

Productivity

Location of winch:
 Choose between:
 [bleibt=stays at location;
 wechselt=changes]

Distance of self-propelled winchtransport

Show Errors

SAVE

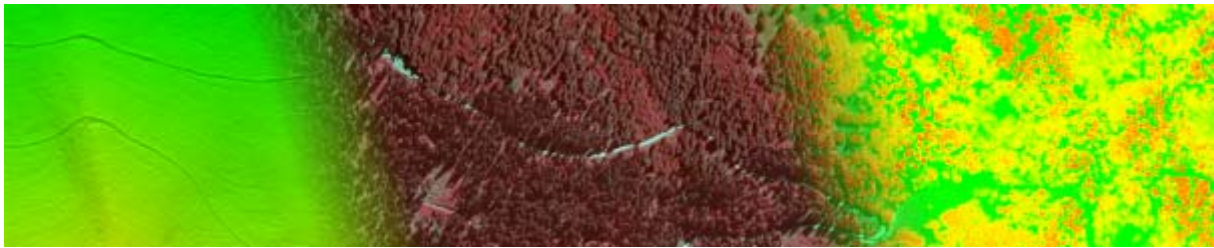
Datasheet

HELP

Print

Time expenditure per h

Costs



Konventioneller Seilkran - Kostenkalkulation

Beispiel Konventioneller Seilkran 1

Faktoren

Arbeitsweise

SFr./Std. **55,00**

SFr./BStd. **70,00**

Seilzeit (in % von Seilzeit) **80**

Arbeitswege und Pausen

Arbeitszeit (Min.) **540**

Arbeitszeit (Min.) **60**

Anzahl Personen

Planung **2**

Montage **3**

Seilen **3**

Demontage **3**

Lagerplatz

Einsatzzeit (in % von Seilzeit) **100**

Kranfahrzeug umsetzen

Weitere Aufwände

SFr. Std.

0 0

0 0

Ergebnis

	Zeitaufwand (Std)		Kosten (SFr.)	
			pro m3	total
Dauer der Arbeit	152,07	WPSH		
Personal	593,45	WPPH	40,80	32639,89
Seilkrananlage	96,47	PMH15	8,44	6752,92
Kranfahrzeug	81,41	PMH15	8,14	6512,98
Kranfahrzeug Umsetzen	0		0,00	0
Weitere Aufwände	0		0,00	0
Total			57,38	45905,79

Produktivität Seilen **8,29 m3/PSH15**

☒ Fehlerliste zeigen

Eingaben speichern Datenblatt Info/Hilfe Drucken

See Page 9

Costs

Personnel

Cable crane

Crane vehicle

Operating time (in % of cable crane operating time = cable time)

Paid duty

Number of Personnel

Planning

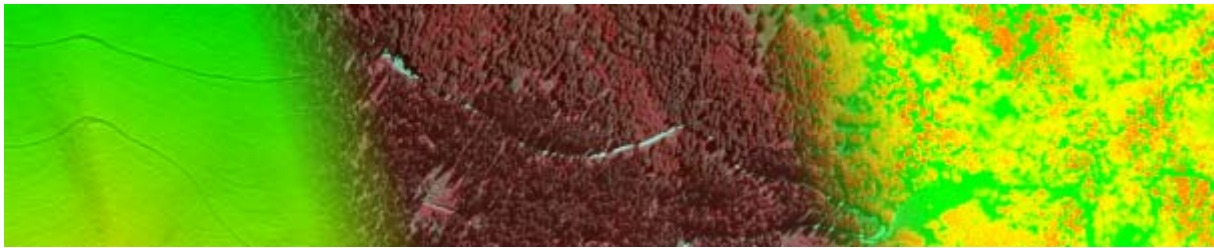
Mounting/Construction

Slide logs by means of ropes

Demounting

Depot/Camp

Operating Time(in %



Konventioneller Seilkran - Kostenkalkulation

Arbeitsort: Beispiel Konventioneller Seilkran 1

Arbeitsobjekt | Arbeitssystem | **Faktoren**

Risiko, Verwaltung, Gewinn (%) Währungskürzel SFr.

Weitere Faktoren

Risk, abministration/management, profit Currency

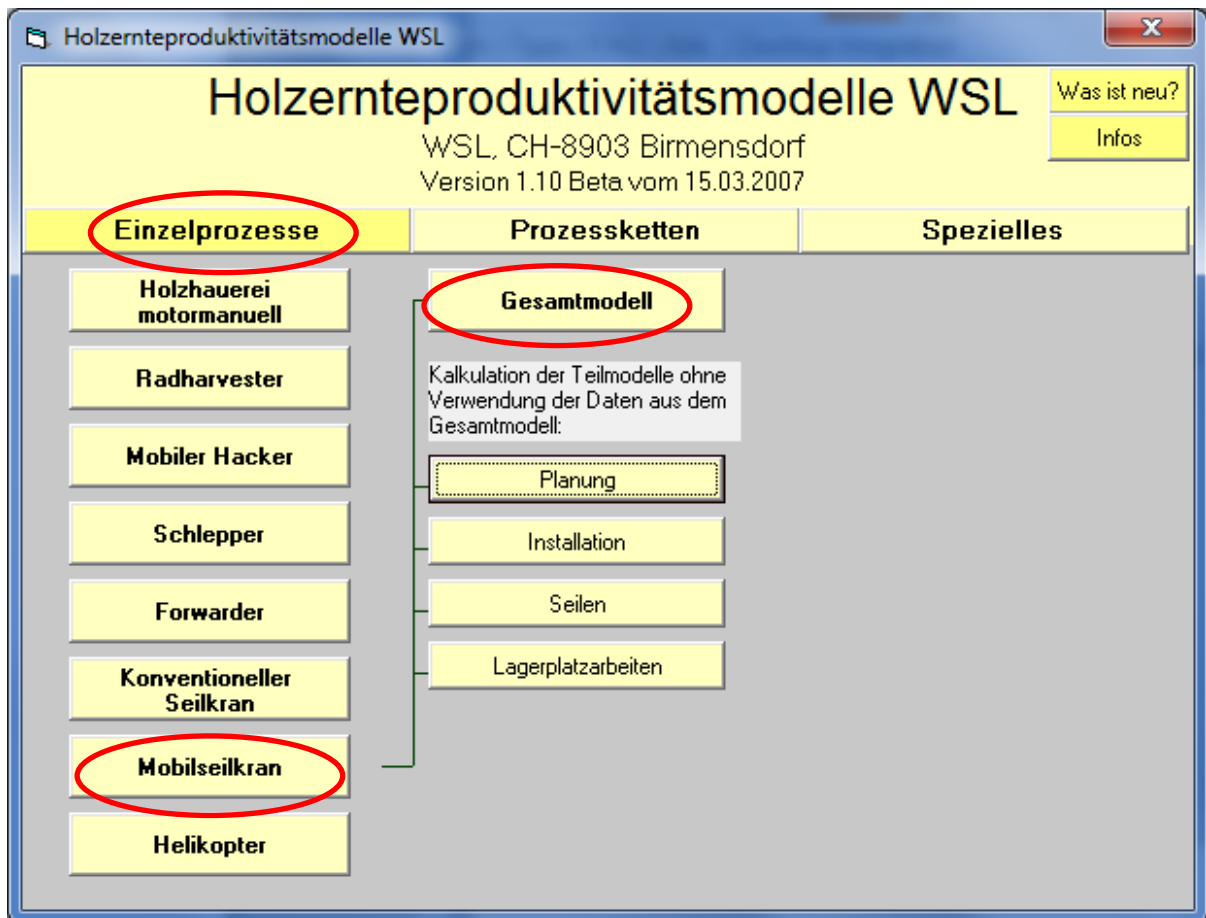
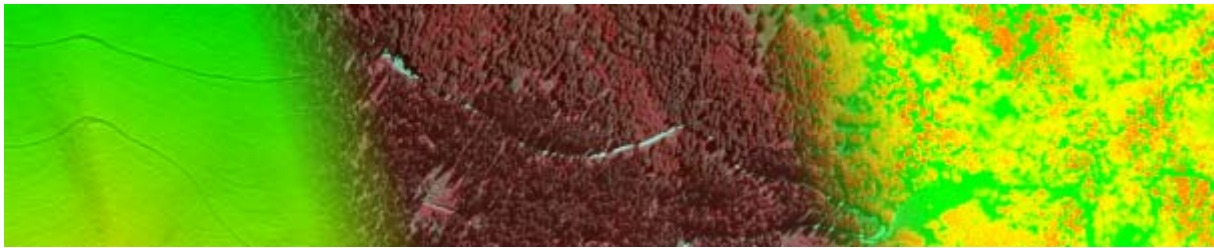
Ergebnis

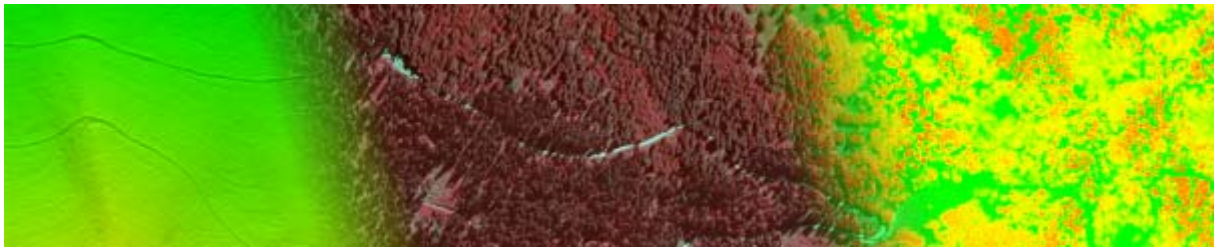
	Zeitaufwand (Std)		Kosten (SFr.)	
			pro m3	total
Dauer der Arbeit	152,07	WPSH		
Personal	593,45	WPPH	40,80	32639,89
Seilkrananlage	96,47	PMH15	8,44	6752,92
Kranfahrzeug	81,41	PMH15	8,14	6512,98
Kranfahrzeug Umsetzen	0		0,00	0
Weitere Aufwände	0		0,00	0
Total			57,38	45905,79

Produktivität Seilen 8,29 m3/PSH15

☒ Fehlerliste zeigen

See page 9





MobilSeilkran - Kostenkalkulation

Beispiel MobilSeilkran 1

Projekt | **Arbeitssystem** | Faktoren

Anzahl an der Seillinie (m3) Mittleres Stückvolumen (m3)

Seilstecken ohne Projekt ☒ Seilsystem Maschinenstandort

Seilweite (m) Stützen Anzahl Nr. Tragseilhöhe (m)

Fahrdistanz (m) Endmast ☒

Distanz seitlicher Schwierigkeit seitlicher

Seilarten

Zeitaufwand (Std)		Kosten (SFr.)	
		pro m3	total
Arbeitszeit	106,72 WPSH		
Seiltransport	272,65 WPPH	37,49	14996,01
Seilzug	43,32 PMH15	13,00	5198,44
Seilzug	34,70 PMH15	6,94	2776,06
Seilzug umsetzen	<input type="text" value="0"/>	0,00	0
Seilzug	<input type="text" value="0"/>	0,00	0
Gesamt		57,43	22970,51

Seilarten m3/PSH15

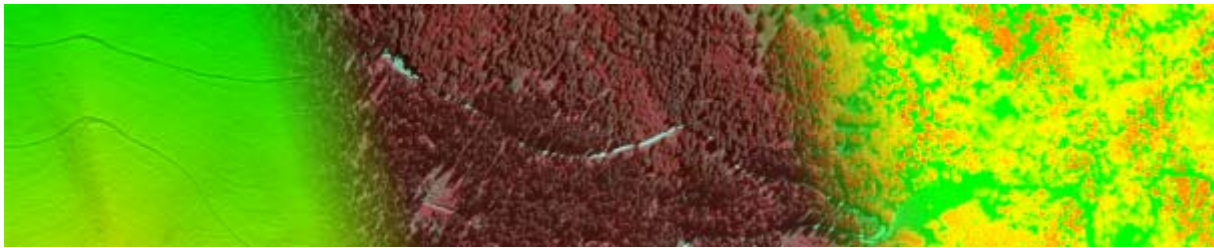
Seile zeigen

Show Errors SAVE DATASHEET HELP PRINT

Time expenditure per h Costs

Annotations:

- Stand/Stock
- Amount of wood at cable line
- Mark line without project
- Length of line
- Average distance
- Average distance of lateral transportation
- Difficulty/complexity of lateral transport
- Easy
- Complicated
- Results
- Duration of work
- Personnel
- Cable crane mobile/portable
- Crane vehicle
- Average piece volume
- Cable system [choose between: 2-Seil System=2 cable system; Mehrseil System=Multiple cable system]
- Location of Machine [choose between: unten=on the bottom; oben=on the top]
- Intermediate Pole/Pillar



The screenshot shows the 'MobilSeilkran - Kostenkalkulation' software window. The 'Faktoren' tab is selected. The interface includes sections for personnel costs, crane costs, operating time, and a detailed cost breakdown table. German labels with arrows point to specific fields: 'Number of Personnel' points to 'Anzahl Personen'; 'Planning' points to 'Planung'; 'Mounutin g/Constru ction' points to 'Installation'; 'Slide logs by means of ropes' points to 'Seilen'; 'Depot/Ca mp' points to 'Lagerplatz'; 'Operating Time(in % of cable time)' points to 'Einsatzzeit (in % von Seilzeit)'; 'Move Crane vehicle' points to 'Kranfahrzeug umsetzen'; 'Other expenditu' points to 'Weitere Aufwände'. Other labels include 'Costs', 'Personnel', 'Cable crane mobile/portable', 'Crane vehicle', 'Operating time (in % of cable time)', 'Paid duty stroke/Break', 'Daily working hours', 'Of which: Paid duty stroke/Break', 'Produktivität Seilen', 'Fehlerliste zeigen', 'Eingaben speichern', 'Datenblatt', 'Info/Hilfe', and 'Drucken'.

Anzahl Personen	
Planung	2
Installation	3
Seilen	3
Lagerplatz	1
Einsatzzeit (in % von Seilzeit)	100

Kranfahrzeug umsetzen	
SFr.	Std.
0	0
0	0

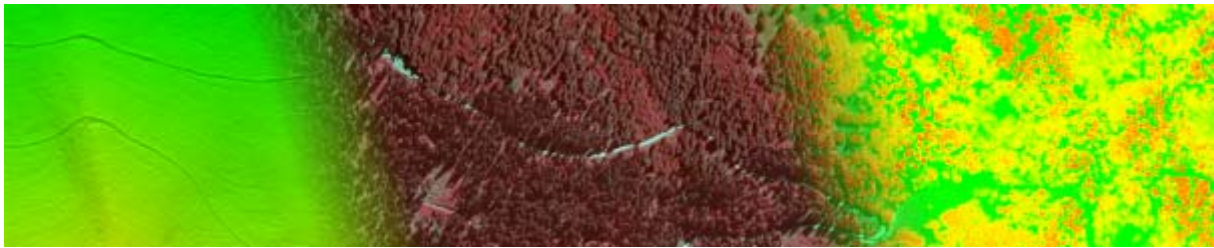
Zeitaufwand (Std)		Kosten (SFr.)	
		pro m3	total
111,60	WPSH	40,81	16324,93
296,82	WPPH	13,28	5312,99
44,27	PMH15	6,94	2776,06
34,70	PMH15		
0		0,00	0
0		0,00	0
		61,03	24413,98

Produktivität Seilen: 9,03 m3/PSH15

☒ Fehlerliste zeigen

Eingaben speichern Datenblatt Info/Hilfe Drucken

See page 20



MobilSeilkran - Kostenkalkulation

Arbeitsort: Beispiel MobilSeilkran 1

Arbeitsobjekt | Arbeitssystem | Faktoren | **Faktoren**

Risiko, Verwaltung, Gewinn (%) 0 Währungskürzel SFr.

Weitere Faktoren

Risk, abministration/management, profit Currency

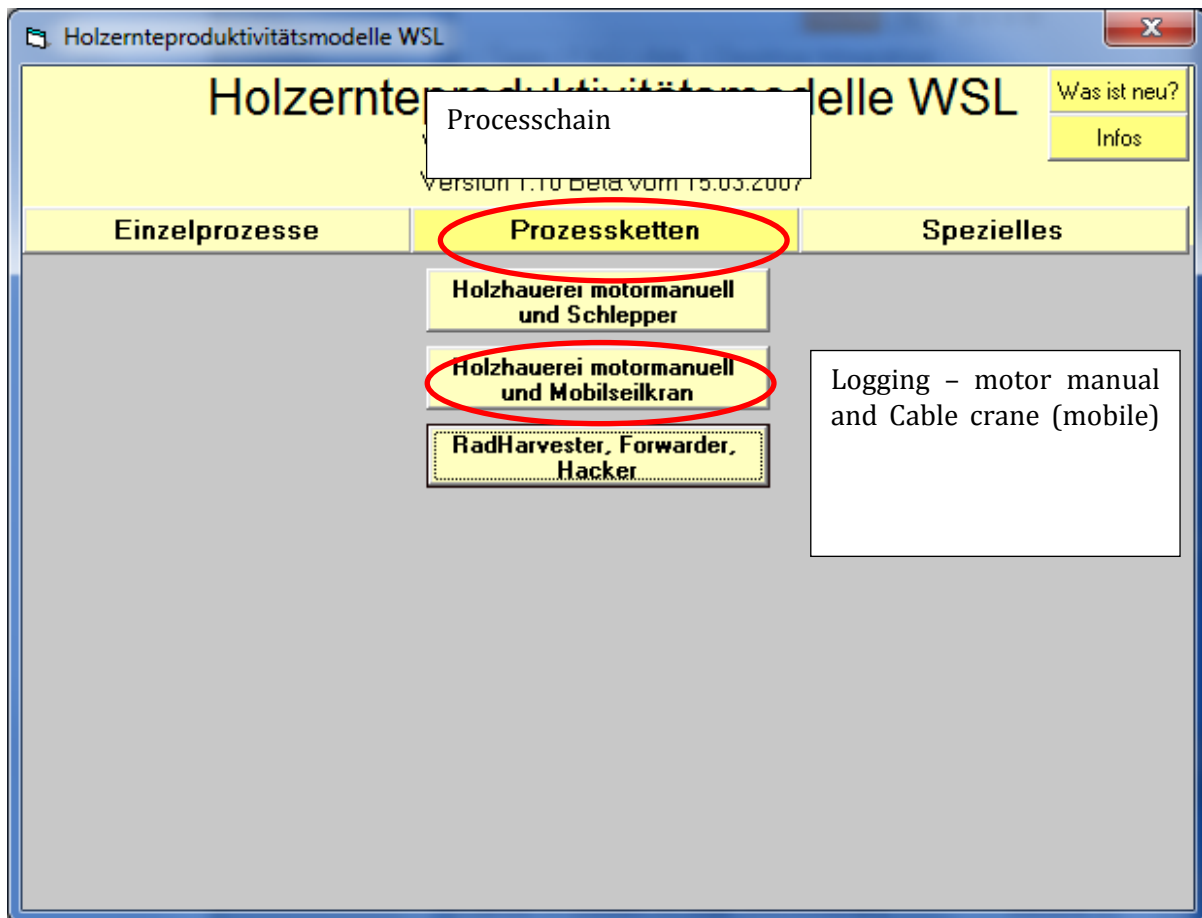
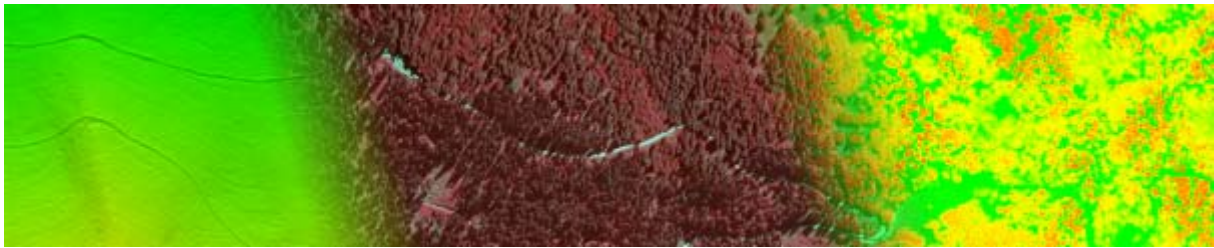
Ergebnis

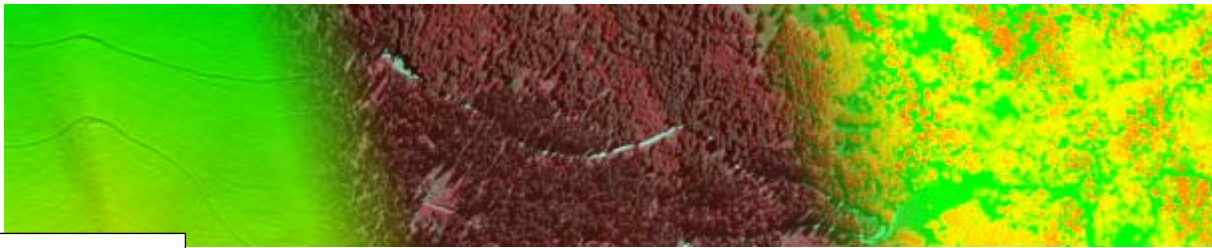
	Zeitaufwand (Std)		Kosten (SFr.)	
			pro m3	total
Dauer der Arbeit	<input type="text"/> 111,60	WPSH		
Personal	<input type="text"/> 296,82	WPPH	<input type="text"/> 40,81	<input type="text"/> 16324,93
Mobilseilkran	<input type="text"/> 44,27	PMH15	<input type="text"/> 13,28	<input type="text"/> 5312,99
Kranfahrzeug	<input type="text"/> 34,70	PMH15	<input type="text"/> 6,94	<input type="text"/> 2776,06
Kranfahrzeug Umsetzen	<input type="text"/> 0		<input type="text"/> 0,00	<input type="text"/> 0
Weitere Aufwände	<input type="text"/> 0		<input type="text"/> 0,00	<input type="text"/> 0
Total			<input type="text"/> 61,03	<input type="text"/> 24413,98

Produktivität Seilen 9,03 m3/PSH15

☒ Fehlerliste zeigen

See page 20





MotorManuell und RückenMitMobilseilkran - Kostenkalkulation

Beispiel Motormanuelle Holzhauerei - Mobilseilkran 1

Objekt | **Arbeitssystem** | **Faktoren**

Gelände | **Sortimentsvorgaben und Ruckebedingungen**

m3 i.R.) Anteil Fällen mit Handseilzug (%) % of felling with hand winch

je Seillinie (m3) Baumsartenanteile (%) Tree species

Stamm (m3 i.R.) Laubholz hardwood

Ruckvolumen für Fichte spruce

Stammklasse Föhre/Laerche fir

Terrain **Hindernisse** Pine/larch

Gradient Handicaps/balk

Non

Minor

Some

Intense

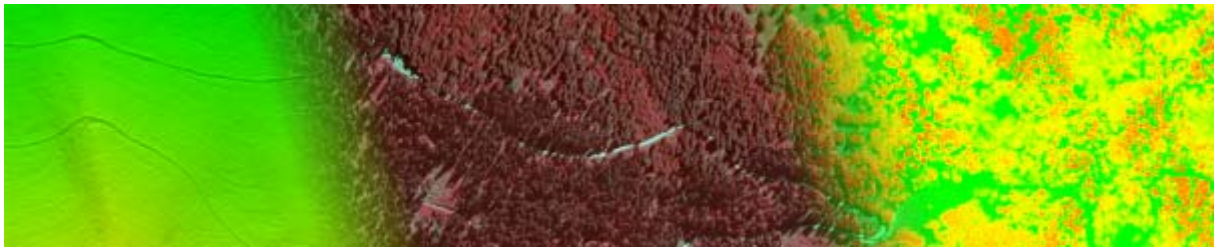
Result (in bark)

Zeitaufwand (Std)		Kosten (SFr.)	
		pre-m3	total
1246,81	WPPH	68,57	68574,38
347,77	PMH15	4,87	4868,78
107,14	PMH15	12,86	12856,96
86,49	PMH15	6,92	6918,82
<input type="text" value="0"/>		0,00	0
<input type="text" value="0"/>		0,00	0
93,22		93218,95	
44,96		44961,62	
48,26		24128,66	

Personnel **Chainsaw** **Cable mobile/portable** **Crane vehicle** **Move Machines** **Other expenditures** **Logging motor-manual** **Extraction with Cable crane mobile/portable**

Show errors **SAVE** **DATASHEET** **HELP** **PRINT**

Costs



Assortment targets and skidding conditions

assortment targets

Amount in %

Stem wood

Industrial wood

Mark line without project

Length of line

Cable system [choose between: 2-Seil System=2 cable system; Mehrseil System= Multiple cable system]

Location of Machine [choose between: unten= on bottom; oben=on top]

Holzauerei Motor Manuell und Rücken Mit Mobilseilkran - Kostenkalkulation

Beispiel Motormanuelle Holzauerei - Mobilseilkran 1

Arbeitsobjekt | **Arbeitssystem** | **Faktoren**

Sortimentsvorgaben und Rückbedingungen

Sortimentsvorgaben: Stuecklaenge, Stammholz, Industrieholz lang

Sortimentsvorgaben: Stuecklaenge: < 4m, Industrieholz lang: bis 7m

Sortimentsvorgaben: Stammholz: 85, Industrieholz lang: 15

Sortimentsvorgaben: ☐ Kanten brechen

Sortimentsvorgaben: ☒ abstecken ohne Projekt

Sortimentsvorgaben: Länge (m): 600

Sortimentsvorgaben: Mittlere Fahrdistanz (m): 250

Sortimentsvorgaben: Mittlere Distanz seitlicher Zuzug (m): 15

Sortimentsvorgaben: Schwierigkeit seitlicher Zuzug: einfach

Sortimentsvorgaben: System: 2-Seil System

Sortimentsvorgaben: Anzahlen: 1, 1

Sortimentsvorgaben: Tragseilhöhe (m): 12

Sortimentsvorgaben: Endmast: ☒

Sortimentsvorgaben: Stützen: Neu, Del

Sortimentsvorgaben: Endmast: ☒

Sortimentsvorgaben: (in Rinde)

Zeitaufwand (Std)		Kosten (SFr.)	
		pro m3	total
1246,81	WPPH	68,57	68574,38
347,77	PMH15	4,87	4868,78
107,14	PMH15	12,86	12856,96
86,49	PMH15	6,92	6918,82
0		0,00	0
0		0,00	0
		93,22	93218,95
		44,96	44961,62
		48,26	24128,66

Sortimentsvorgaben:

Piece Lengths

Stem wood

Industrial wood [bis=until]

chamfering

Average distance

Average distance lateral transport

Difficulty/complexity of lateral transport

Easy=einfach

Complicated

Intermediate Pole/Pillar

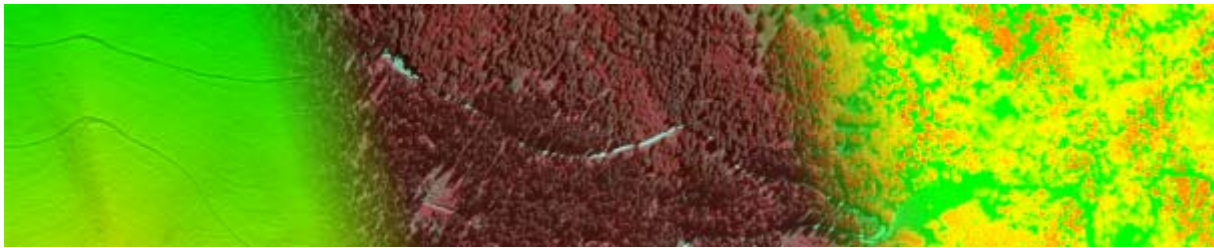
New (additional)

Amount

Number

Skyline/carrying zone height

See page 24



Holzhauberei Motor Manuell und Rücken Mit Mobilseilkran - Kostenkalkulation

Beispiel Motormanuelle Holzhauberei - Mobilseilkran 1

Arbeitsobjekt | **Arbeitsystem** | **Faktoren**

Arbeitsansätze

	SFr./Std.
Personal	55,00
Chainsäge	14,00
Mobilseilkran	120,00
Fahrzeug	80,00
Aufzeit (in % von Seilzeit)	75

Faktoren

Anzahl Personen Mobilseilkran	
Planung	2
Installation	3
Seilen	2
Lagerplatz	1
Einsatzzeit (in % von Seilzeit)	100

Arbeitszeiten und Pausen

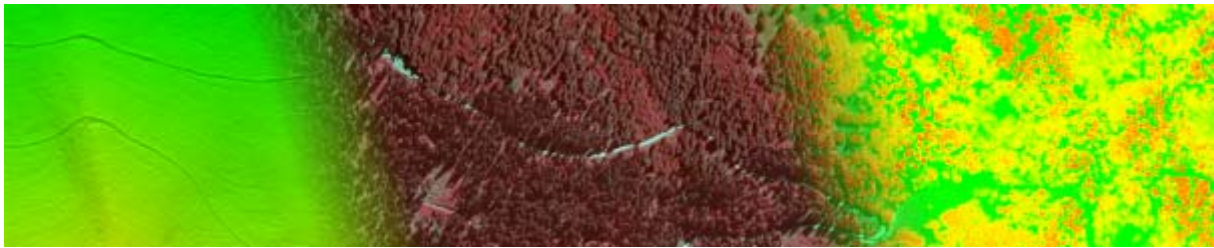
	SFr.	Std.
Arbeitszeit (Min.)	540	
on bezahlte Wegzeiten u. (Min.)	60	
Maschinen Umsetzen	0	0
Weitere Aufwände	0	0

Ergebnis (in Rinde)

	Zeitaufwand (Std.)	Kosten (SFr.)
Personal	1246,81 WPPH	68,57
Chainsäge	347,77 PMH15	4,87
Mobilseilkran	107,14 PMH15	12,86
Fahrzeug	86,49 PMH15	6,92
Maschinen Umsetzen	0	0,00
Weitere Aufwände	0	0,00
Gesamt	1588,21	93,22
pro m3		93218,95
total		44961,62
total		24128,66

Buttons: Eingaben speichern, Datenblatt, Info/Hilfe, Drucken

See page 24



HolzHauereiMotorManuell und RückenMitMobilseilkran - Kostenkalkulation

Arbeitsort: Beispiel Motormanuelle Holzhauerei - Mobilseilkran 1

Arbeitsobjekt: Arbeitssystem: **Faktoren**

Risiko, Verwaltung, Gewinn (%) Währungskürzel

Weitere Faktoren

Ergebnis - (in Rinde)

	Zeitaufwand (Std)		Kosten (SFr.)	
			pro m3	total
Personal	1246,81	WPPH	68,57	68574,38
Motorsäge	347,77	PMH15	4,87	4868,78
Mobilseilkran	107,14	PMH15	12,86	12856,96
Kranfahrzeug	86,49	PMH15	6,92	6918,82
Maschinen Umsetzen	0		0,00	0
Weitere Aufwände	0		0,00	0
Total			93,22	93218,95
Holzhauerei motormanuell			44,96	44961,62
Bringung mit Mobilseilkran			48,26	24128,66

☐ Fehlerliste zeigen

Risk, administration/management, profit
Currency

See page 24