MUNI
SPORT

Orienteering: training in endurance running sport with a map

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…few words about me

- O-runner since 1998, „former“ road and track runner and Ironman triathlete, floorball player, climber, hiker, MTB rider, …
- PhD student in Sports Science, MUNI SPORT (S&C)
- At MUNI:
  - Teaching classes S&C, T&F, SS
  - Quality coordinator for study programmes
  - Research: running economy, data analysis, …
- S&C coach in O, long-distance running, football, …
- Lecturing in coaches training (T&F, O, floorball, football, karate, XC skiing, …)
- Certified coach in O, T&F and DNS

Tomas Kalina, tkalina@fsps.muni.cz

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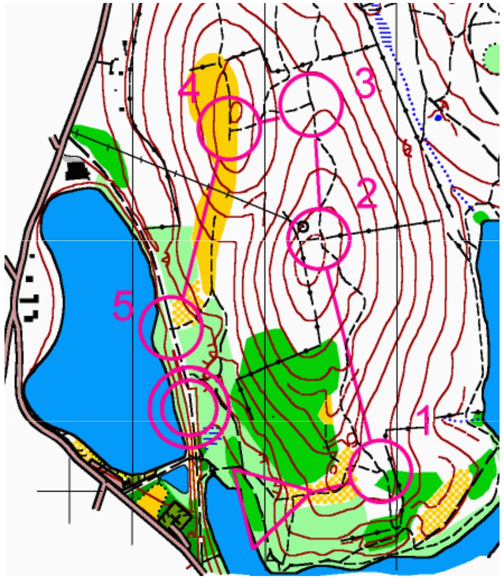
Focus of the lecture

- Orienteering
  - Definition, rules, competitions, disciplines & principles
- Technical and tactical component of o-performance
- Physical preparation in orienteering
  - General principles in orienteering
  - Case study: female member of Czech national team

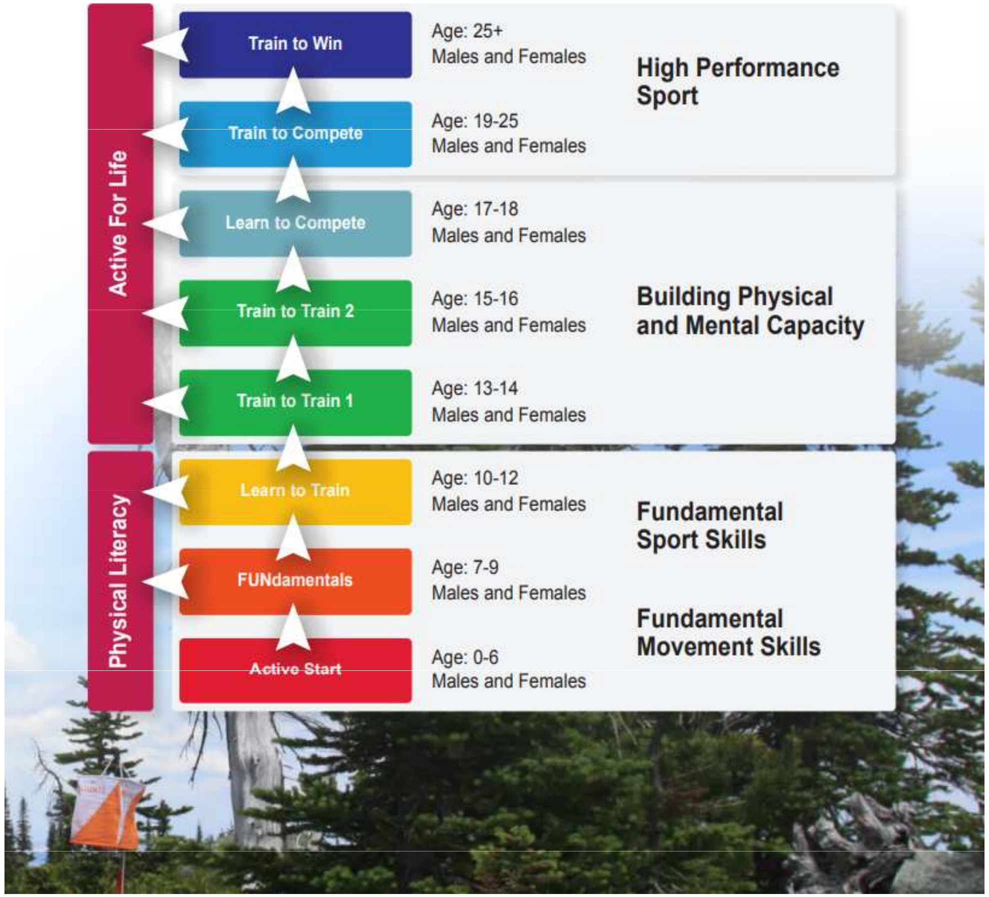
SILVA
DARNAWAY EASY

Intro to orienteering

- Over 100 years of history and development (Scandinavia)
- Non-olympic outdoor sport
- Principle is to run through the check-points in the shortest possible time just with the help of map and compass



O-competitions


Active For Life
Physical Literacy
Train to Win
Age: 25+
Males and Females
Train to Compete
Age: 19-25
Males and Females
High Performance Sport
Learn to Compete
Age: 17-18
Males and Females
Train to Train 2
Age: 15-16
Males and Females
Building Physical and Mental Capacity
Train to Train 1
Age: 13-14
Males and Females
Learn to Train
Age: 10-12
Males and Females
Fundamental Sport Skills
FUNdamentals
Age: 7-9
Males and Females
Fundamental Movement Skills
Active Start
Age: 0-6
Males and Females

- Categories
  - Gender: M or W
  - Age groups: 10,12,14,16,18, 20, **21**, 35, 40, …, 95
- Level:
  - Local
  - Regional
  - National
  - International (Continental and World Championship, World Cup, World Ranking Events)

O-races

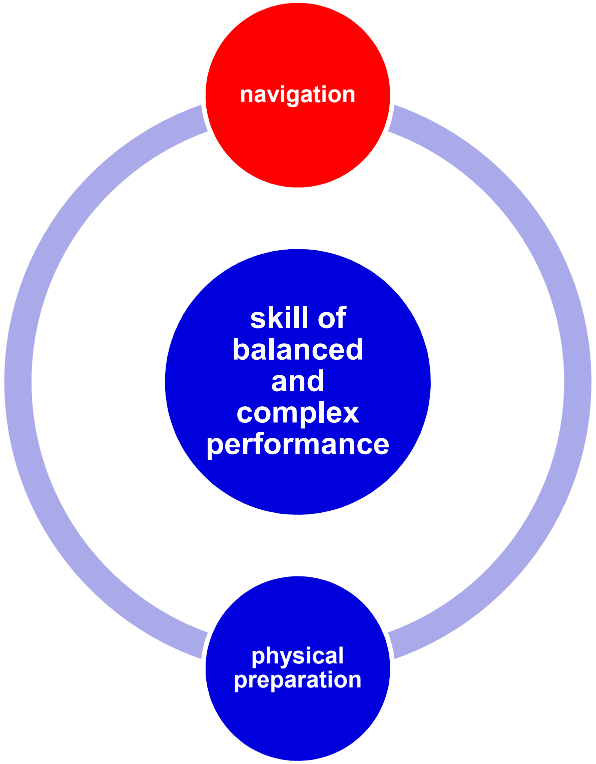
Individual

- **Sprint** (12-15 min)
- **Middle** distance (30-35 min)
- **Long** distance (M 90-100, W 70-80)
- **Knock-out** sprint/eliminator (Q→4F→SF→F; Q=8 min, 6-8 for knock-out rounds)
- (night, free-order, ultralong, …)

Relay

- **Relay** (MMM or WWW; 30-40 min per leg)
- **Sprint relay** (MWMW; 12-15 per leg)
- (Team relay – Tiomila – 10 men‘s legs)

O-performance

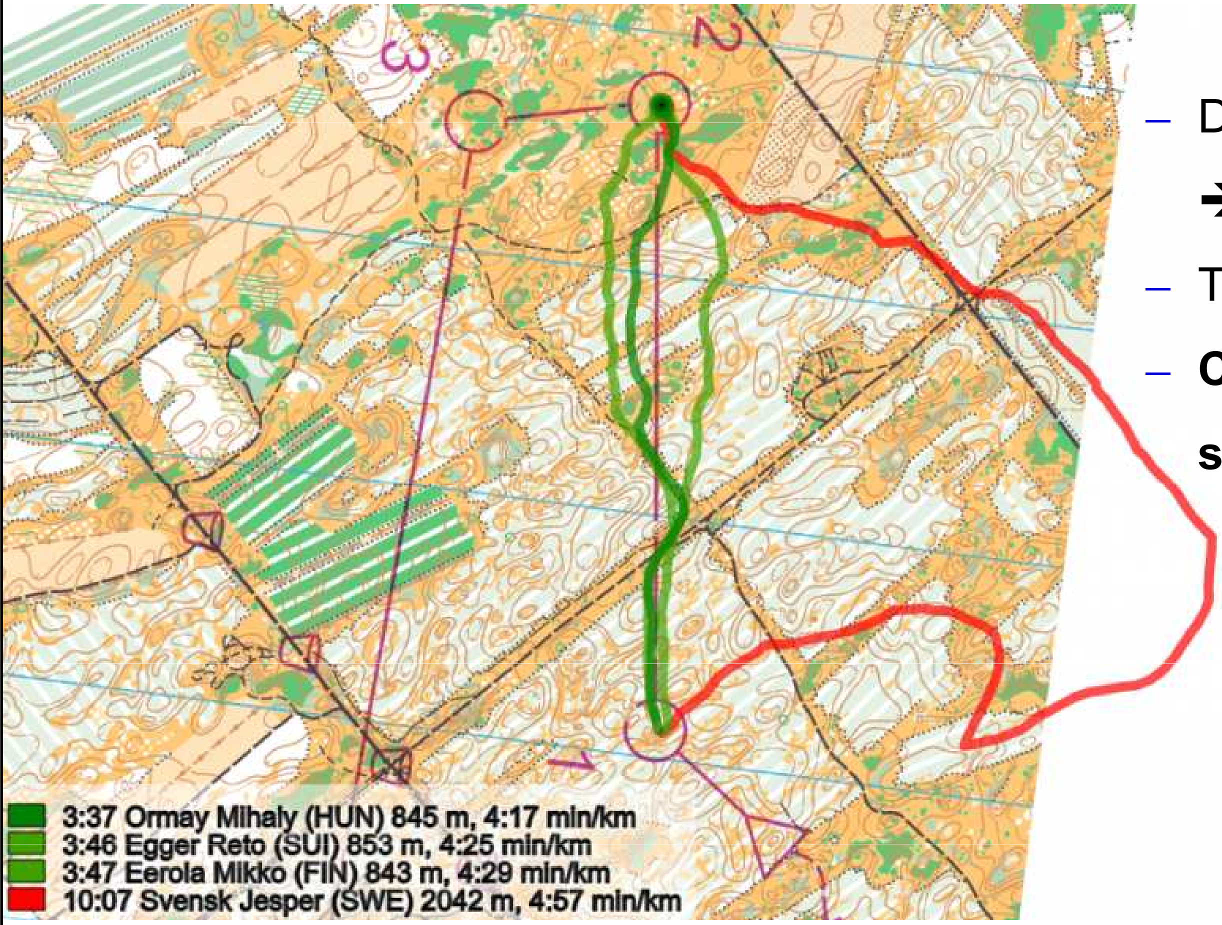


navigation

skill of balanced and complex performance

physical preparation

Navigation


3
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1
🟩 3:37 Ormay Mihaly (HUN) 845 m, 4:17 min/km
🟩 3:46 Egger Reto (SUI) 853 m, 4:25 min/km
🟩 3:47 Eerola Mikko (FIN) 843 m, 4:29 min/km
🟥 10:07 Svensk Jesper (SWE) 2042 m, 4:57 min/km

- Don‘t think about O as running race
  ➔navigation instability
- The most important things are unobservable
- **Conscious** control of the race is the basis for **stabilizing** the O's performance

Conscious & stable race

- Goals (in that order!):
  - No mistakes
  - Ideal routechoise
  - Fast (not running, but making a plan and realization afterwards)

- If you
  - finish the tasks successfully → proud & fix
  - don‘t finish the tasks successfully → dissatisfaction & analyze the mistakes

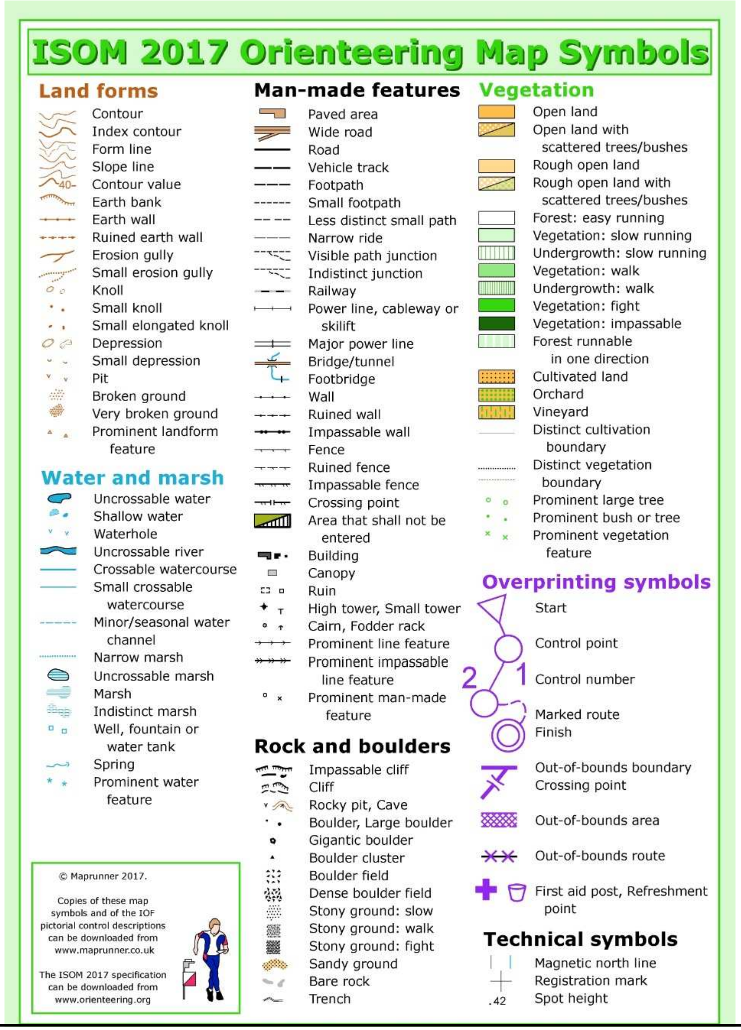
- General method for navigation is:
  - **continuous plan creation**

    In every second of the race I know where I am and have a clear idea what will be situation in a few moments

Conscious control of the race

- „I have full control about my race.“
- „Performance over result.“
- „Just me, checkpoints, map and terrain.“
- „Orienteering is like driving a car. When you don‘t know where you are going to, you have to slow down or stop.“
- „Every routechoise is challenge to solve.“

Navigation sklil progression – basic level



ISOM 2017 Orienteering Map Symbols

Land forms

- Contour
- Index contour
- Form line
- Slope line
- Contour value
- Earth bank
- Earth wall
- Ruined earth wall
- Erosion gully
- Small erosion gully
- Knoll
- Small knoll
- Small elongated knoll
- Depression
- Small depression
- Pit
- Broken ground
- Very broken ground
- Prominent landform feature

Water and marsh

- Uncrossable water
- Shallow water
- Waterhole
- Uncrossable river
- Crossable watercourse
- Small crossable watercourse
- Minor/seasonal water channel
- Narrow marsh
- Uncrossable marsh
- Marsh
- Indistinct marsh
- Well, fountain or water tank
- Spring
- Prominent water feature

© Maprunner 2017.

Copies of these map symbols and of the IOF pictorial control descriptions can be downloaded from www.maprunner.co.uk

The ISOM 2017 specification can be downloaded from www.orienteering.org

Man-made features

- Paved area
- Wide road
- Road
- Vehicle track
- Footpath
- Small footpath
- Less distinct small path
- Narrow ride
- Visible path junction
- Indistinct junction
- Railway
- Power line, cableway or skilift
- Major power line
- Bridge/tunnel
- Footbridge
- Wall
- Ruined wall
- Impassable wall
- Fence
- Ruined fence
- Impassable fence
- Crossing point
- Area that shall not be entered
- Building
- Canopy
- Ruin
- High tower, Small tower
- Cairn, Fodder rack
- Prominent line feature
- Prominent impassable line feature
- Prominent man-made feature

Rock and boulders

- Impassable cliff
- Cliff
- Rocky pit, Cave
- Boulder, Large boulder
- Gigantic boulder
- Boulder cluster
- Boulder field
- Dense boulder field
- Stony ground: slow
- Stony ground: walk
- Stony ground: fight
- Sandy ground
- Bare rock
- Trench

Vegetation

- Open land
- Open land with scattered trees/bushes
- Rough open land
- Rough open land with scattered trees/bushes
- Forest: easy running
- Vegetation: slow running
- Undergrowth: slow running
- Vegetation: walk
- Undergrowth: walk
- Vegetation: fight
- Vegetation: impassable
- Forest runnable in one direction
- Cultivated land
- Orchard
- Vineyard
- Distinct cultivation boundary
- Distinct vegetation boundary
- Prominent large tree
- Prominent bush or tree
- Prominent vegetation feature

Overprinting symbols

- Start
- Control point
- Control number
- Marked route
- Finish
- Out-of-bounds boundary
- Crossing point
- Out-of-bounds area
- Out-of-bounds route
- First aid post, Refreshment point

Technical symbols

- Magnetic north line
- Registration mark
- Spot height

- Map symbols
- Terrain to map transformation
- Map to terrain transformation
- Map orientation (N)
- Distance estimate
- Plan creation and realization using „lines“

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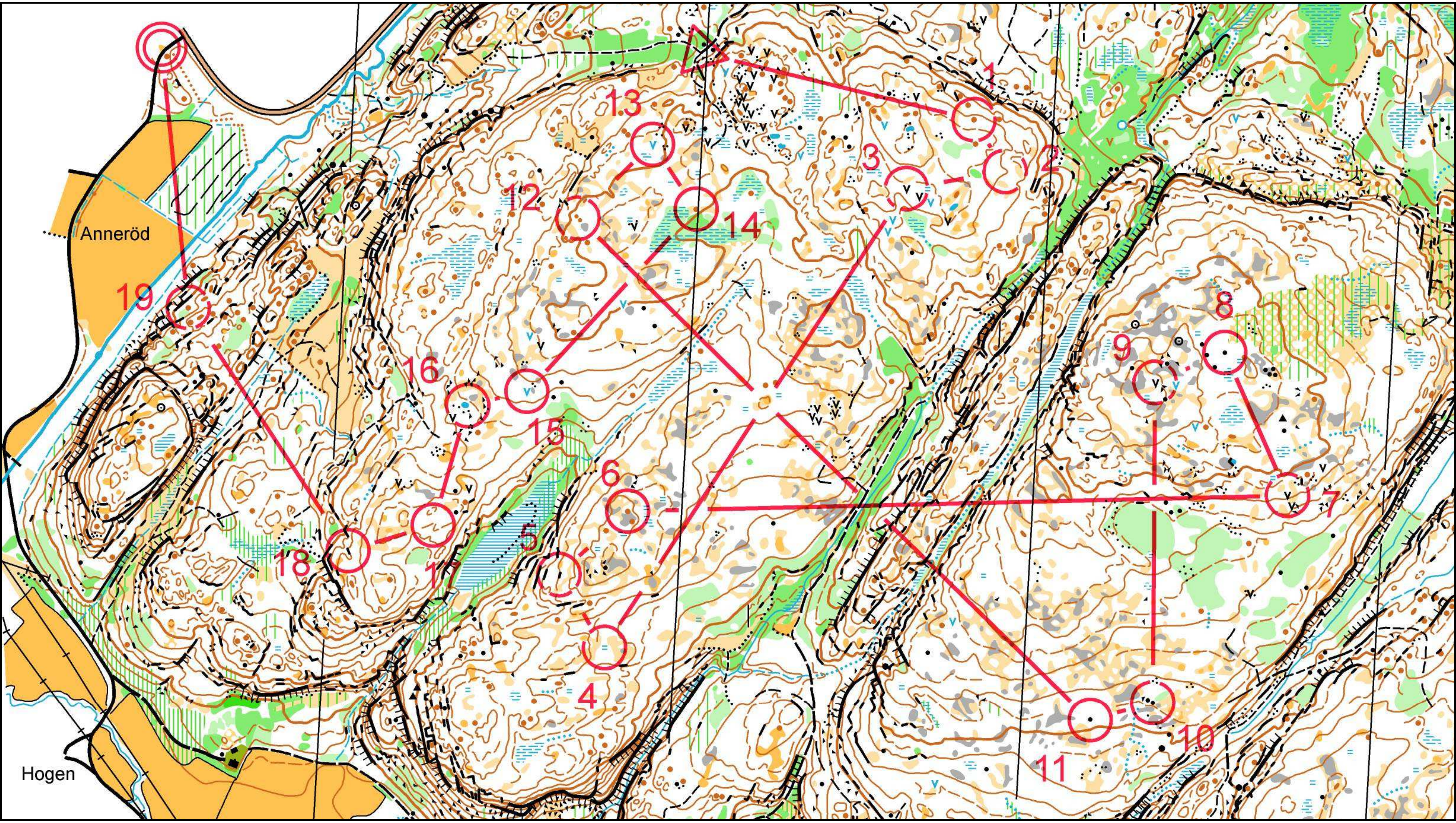
Navigation sklil progression – advanced

- Running straightforward (compass)
- Running at the same level (contour)
- Plan without „lines“
- Progression in running pace up to the physical barrier
- Navigation under the stress
- Extending terrain portfolio (next few slides)
- Specific peaking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SHOCKLEY RANCH

OCALA NATIONAL FOREST - SEMINOLE RANGER DISTRICT

SCALE 1: 15000
CONTOURS 2.5m
YEAR 1999

F·L·O·R·I·D·A
ORIENTEERING

Magnetic North

LEGEND

- Wide dirt road
- Vehicle Track
- Trail
- Narrow trail
- Less distinct trail
- Cutline, indistinct track
- Ruined fence
- Power line
- Contour
- Index contour
- Form line, slope line
- Dry ditch
- Earth wall
- Knoll, small knoll
- Depression
- Shallow depression, pit
- Open land, fast running
- Open land, rough running
- Rough open with scattered trees
- Forest, fast running
- Forest, slow running
- Forest, difficult to run
- Scattered thickets, Undergrowth
- Undergrowth; slow running
- Distinct vegetation change

SPECIAL SYMBOLS

- Hunter's platform
- Cultural object
- Root stock
- Oak or palmetto thicket
- Distinct dead pine or palm tree

TRAILS

- Bike trail (yellow blaze)

CREDITS

Base map: Olaf Helgesen, o-kart-team, Kongsberg, Norway.
Field Survey and artwork: Mark Adams, 1995.
Partially revised: Malcolm Adams, April - May, 1999.
Printing: MP Photo Reproductions Ltée., Montreal, Québec, Canada.

This Orienteering map has been produced through the gracious cooperation of the Seminole Ranger District of Ocala National Forest, Mr. Jim Thorsen, District Ranger.

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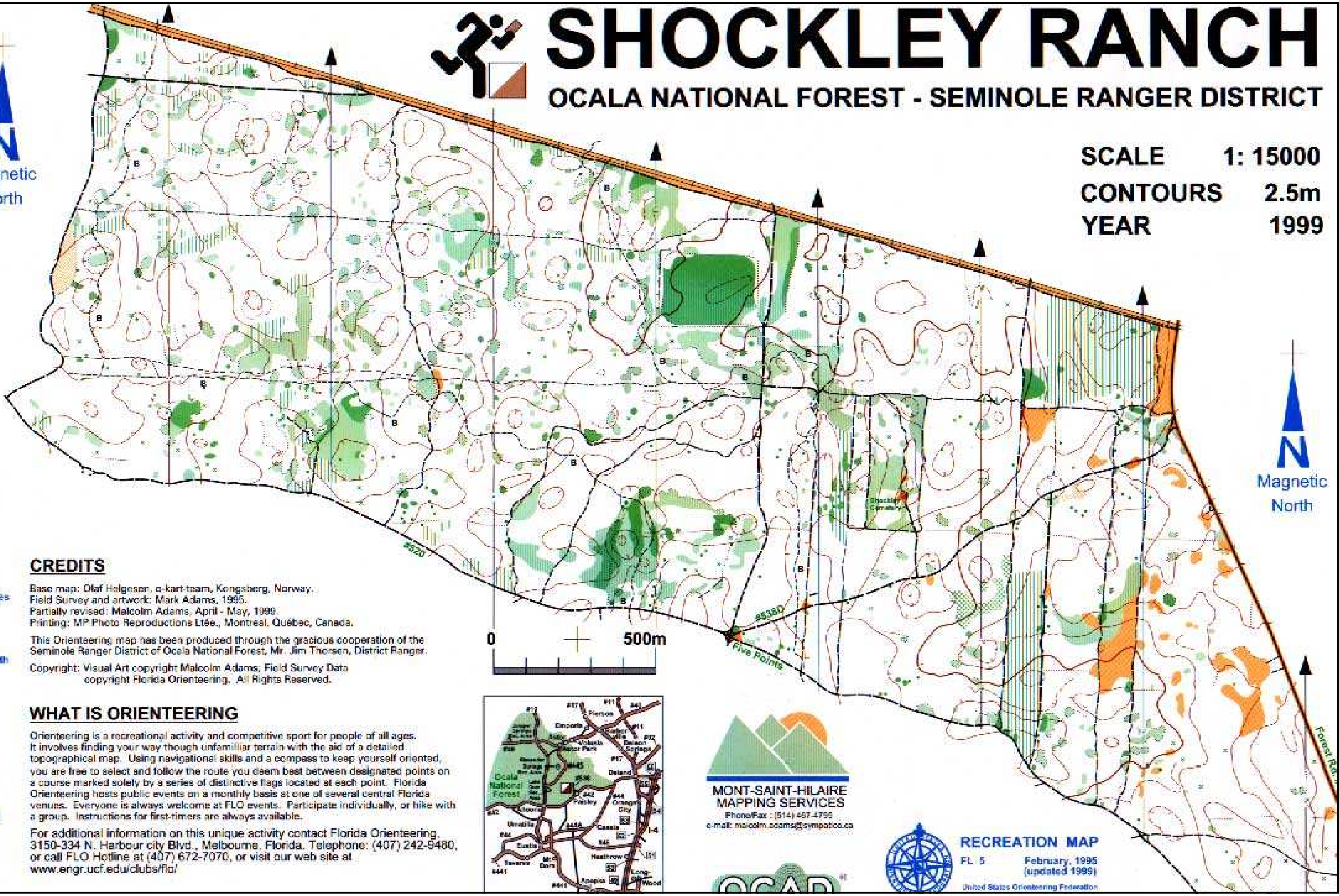
WHAT IS ORIENTEERING

Orienteering is a recreational activity and competitive sport for people of all ages. It involves finding your way though unfamilliar terrain with the aid of a detailed topographical map. Using navigational skills and a compass to keep yourself oriented, you are free to select and follow the route you deem best between designated points on a course marked solely by a series of distinctive flags located at each point. Florida Orienteering hosts public events on a monthly basis at one of several central Florida venues. Everyone is always welcome at FLO events. Participate individually, or hike with a group. Instructions for first-timers are always available.

For additional information on this unique activity contact Florida Orienteering, 3150-334 N. Harbour city Blvd., Melbourne, Florida. Telephone: (407) 242-9480, or call FLO Hotline at (407) 672-7070, or visit our web site at www.engr.ucf.edu/clubs/flo/

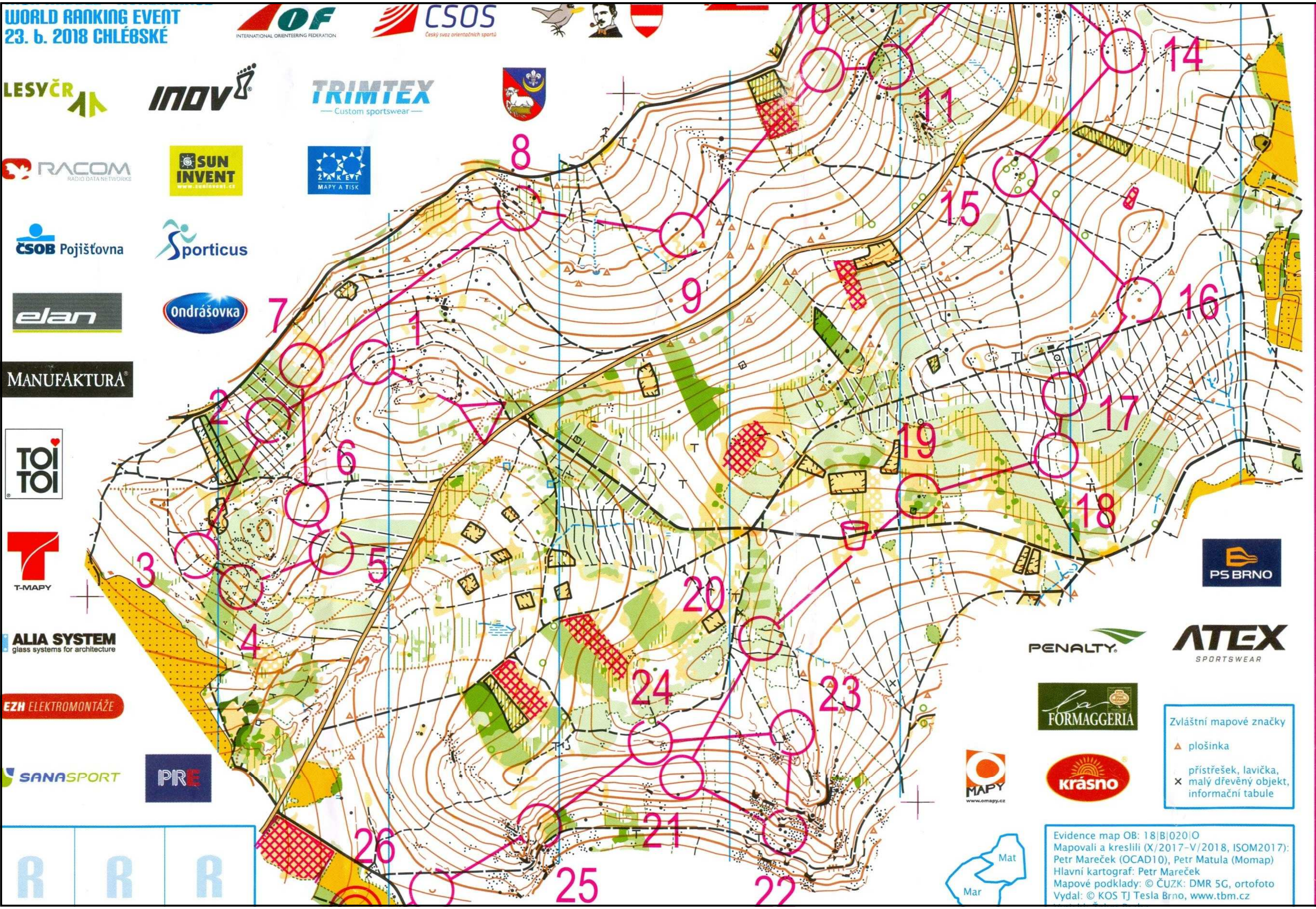


MONT-SAINT-HILAIRE
MAPPING SERVICES
Phone/Fax : (514) 467-4796
e-mail: malcolm.adams@sympatico.ca

RECREATION MAP
FL 5 February, 1995
(updated 1999)
United States Orienteering Federation

WORLD RANKING EVENT
23. 6. 2018 CHLÉBSKÉ

IOF INTERNATIONAL ORIENTEERING FEDERATION
CSOS Český svaz orientačních sportů
LESYČR
INOV8
TRIMTEX Custom sportswear
RACOM RADIO DATA NETWORKS
SUN INVENT www.suninvent.cz
ŽAKET MAPY A TISK
ČSOB Pojišťovna
Sporticus
elan
Ondrášovka
MANUFAKTURA
TOI TOI
T-MAPY
ALIA SYSTEM glass systems for architecture
EZH ELEKTROMONTÁŽE
SANASPORT
PRE
PS BRNO
PENALTY
ATEX SPORTSWEAR
la FORMAGGERIA
krásno
MAPY www.omapy.cz



Zvláštní mapové značky

△ plošinka

× přístřešek, lavička, malý dřevěný objekt, informační tabule

Evidence map OB: 18|B|020|O
Mapovali a kreslili (X/2017–V/2018, ISOM2017):
Petr Mareček (OCAD10), Petr Matula (Momap)
Hlavní kartograf: Petr Mareček
Mapové podklady: © ČUZK: DMR 5G, ortofoto
Vydal: © KOS TJ Tesla Brno, www.tbm.cz

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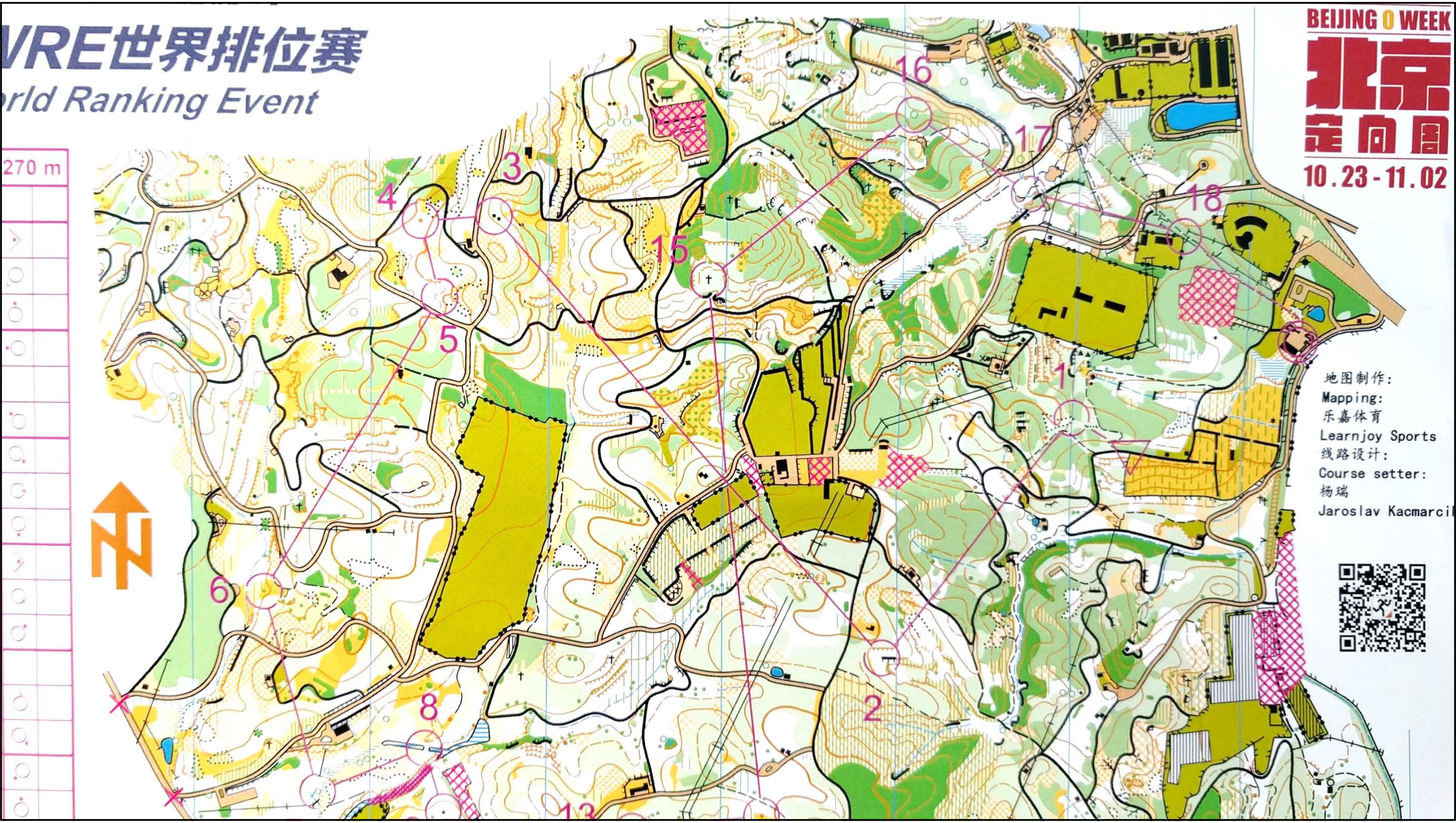
VRE世界排位赛

orld Ranking Event


270 m
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BEIJING O WEEK

北京定向周

10.23-11.02

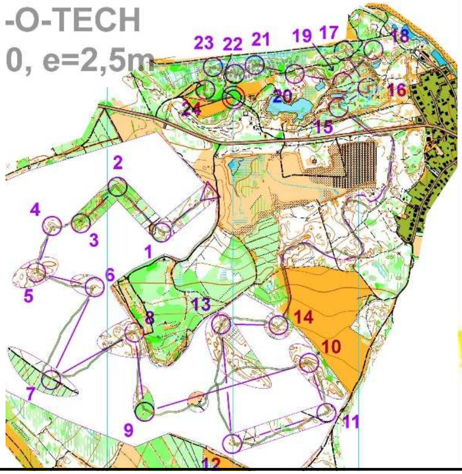
地图制作：
Mapping:
乐嘉体育
Learnjoy Sports
线路设计：
Course setter:
杨瑞
Jaroslav Kacmarci

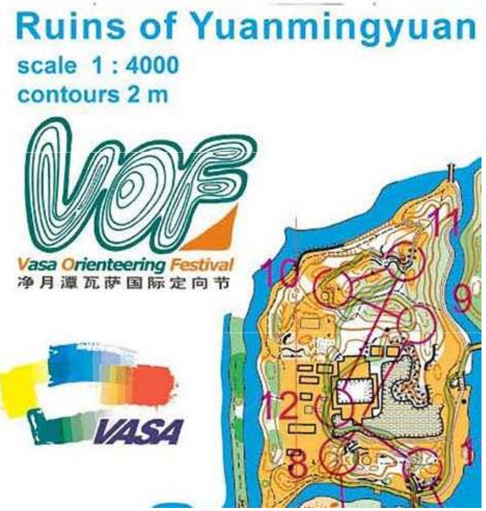
Process of navigation

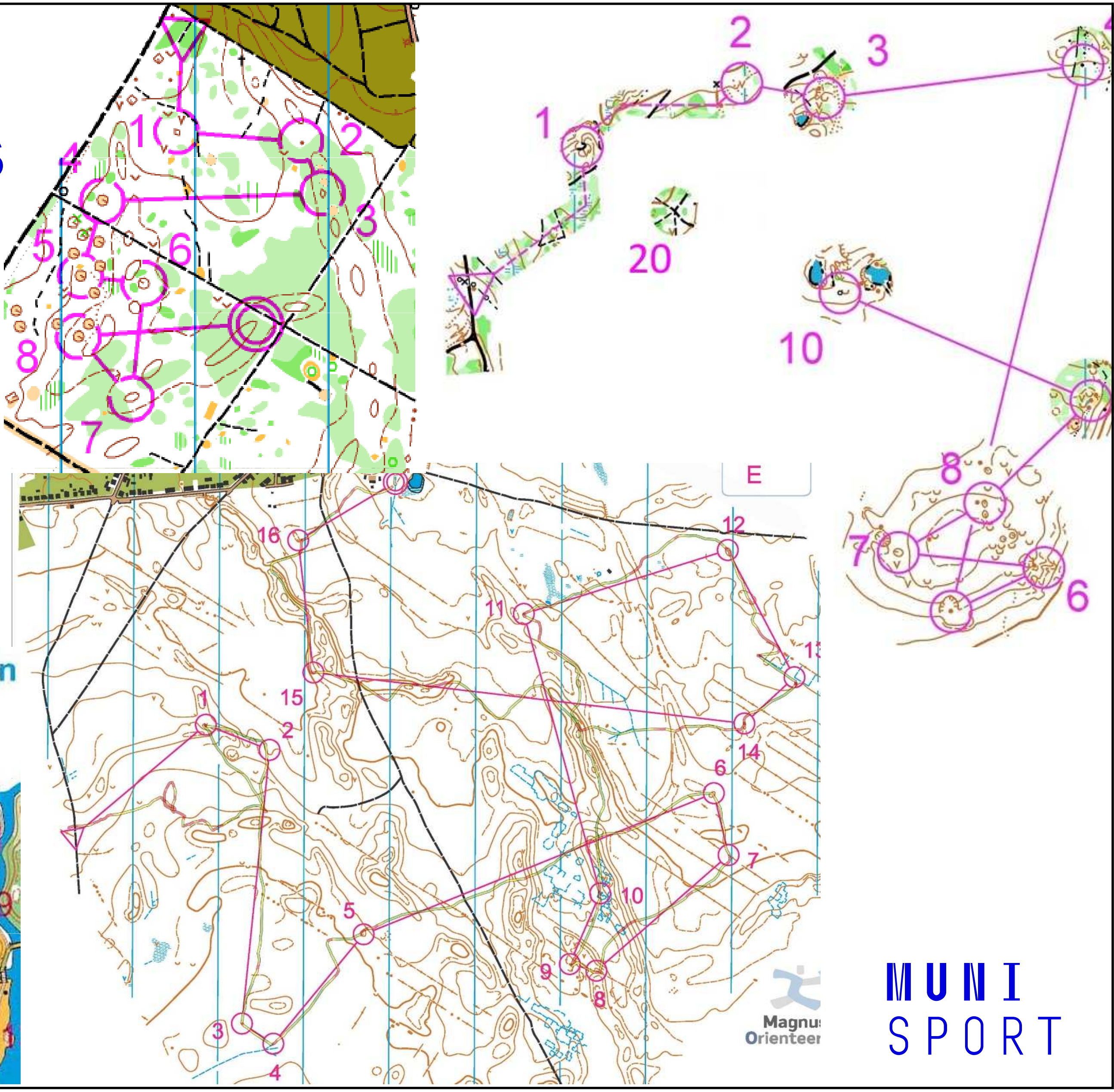
- WHERE? Routechoice
- HOW? Continuous selection of significant and visible orienteering points and linking them
  - Visually and/or
  - with navigation sklil (straight, contour running, …)

Map training types

- Basic o-navigation skills
- Develop, refresh and fix!
- Exmaples:
    - Only brown-color map
    - „White spaces“
    - „Necklace of beads“
    - Limited map reading
    - Lines
    - Checkpoint description reading
    - Combinations


-O-TECH
0, e=2,5m
23 22 21 19 17 18
24 20 16 15
2 4 3 1 6 5
13 8 14 10
7 9 11 12


Ruins of Yuanmingyuan
scale 1 : 4000
contours 2 m
VOF
Vasa Orienteering Festival
净月潭瓦萨国际定向节
VASA
10 11 9 12 8


1 2 3 4 5 6 7 8
1 2 3 20 10 8 7 6
E
16 12 11 13 15 1 2 14 6 7 10 5 9 8 3 4
Magnus
Orienteer

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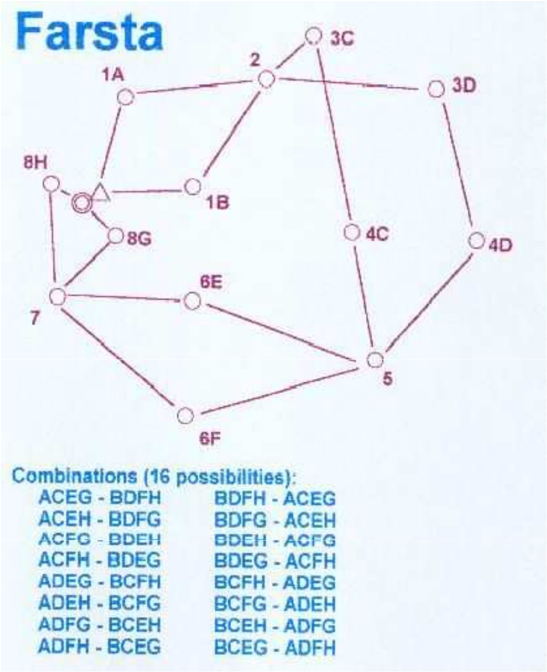
Map training types #2

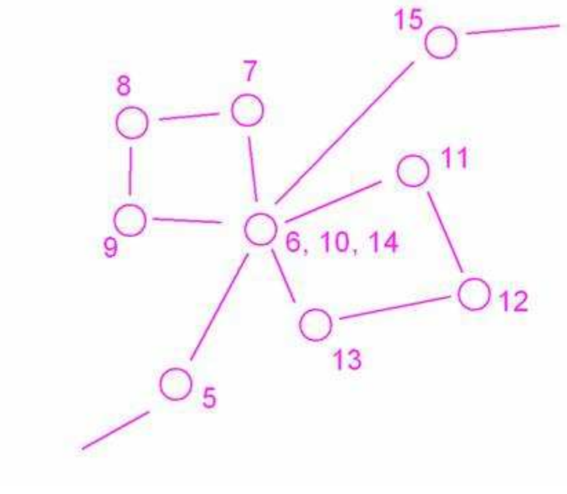
- Map/terrain portfolio
  - Different terrains → different techniques
  - More robust o-performance, more independent on type of terrain, map generalization, surface, visibility, vegetation
- Race specific situation
  - Mass start
  - Contacts (relays, pursuit, …)
  - Refreshment
  - Short/long leg
  - Forks (farsta)/butterfly
- Complex
  - Race, training race
  - Map loops, course simulation



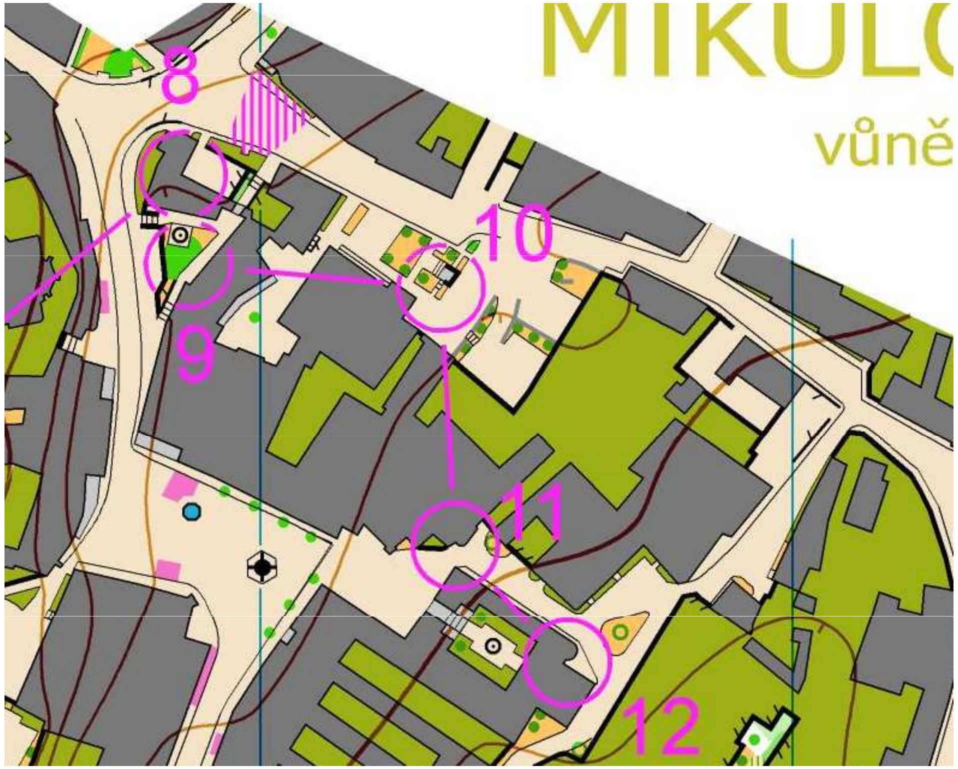
Combinations (16 possibilities):

ACEG - BDFH
ACEH - BDFG
ACFG - BDEH
ACFH - BDEG
ADEG - BCFH
ADEH - BCFG
ADFG - BCEH
ADFH - BCEG

BDFH - ACEG
BDFG - ACEH
BDEH - ACFG
BDEG - ACFH
BCFH - ADEG
BCFG - ADEH
BCEH - ADFG
BCEG - ADFH



Select the shortest way from 10 to 11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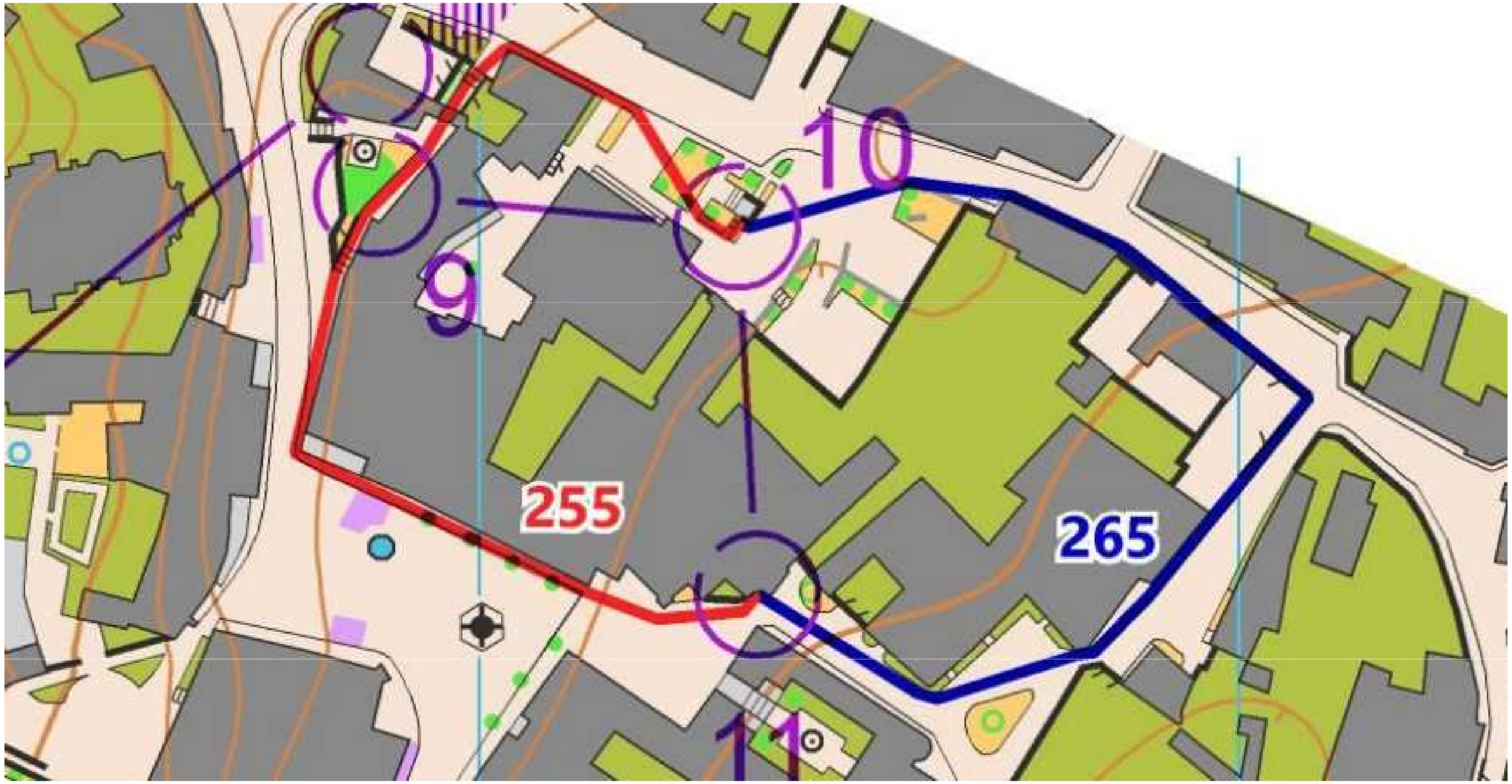
Shortest way from 10 to 11 - solution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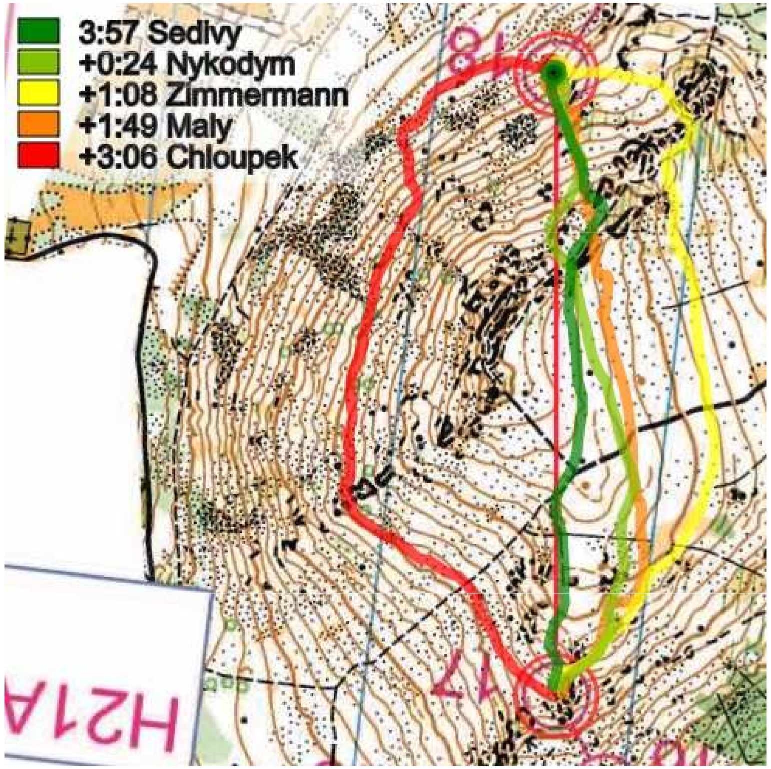
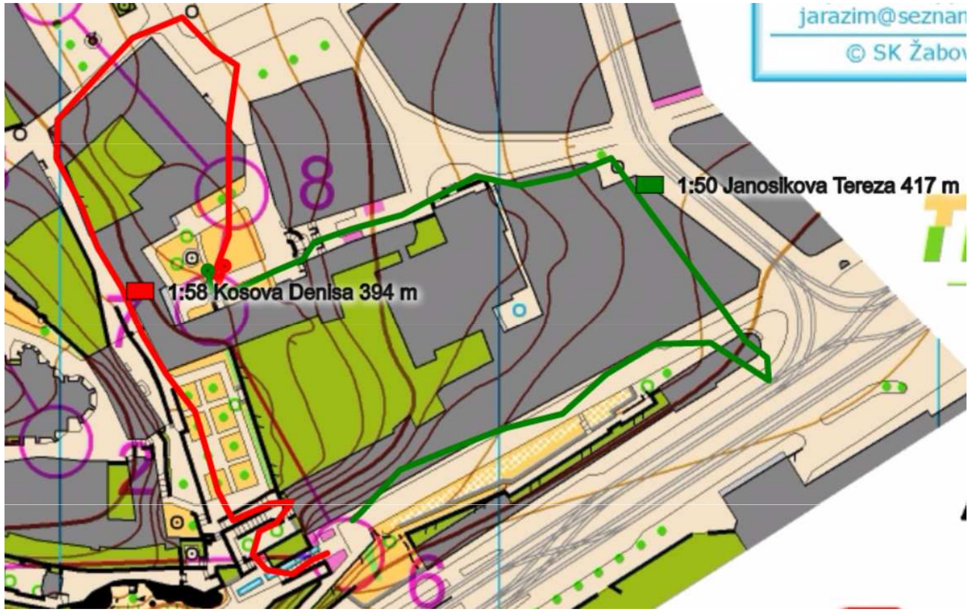
The shortest in not (everytime) the fastest

Forrest


3:57 Sedivy
+0:24 Nykodym
+1:08 Zimmermann
+1:49 Maly
+3:06 Chloupek
18
17
H21A

City

BTW: It‘s Brno! ☺


jarazim@seznan
© SK Žabov
1:50 Janosikova Tereza 417 m
1:58 Kosova Denisa 394 m
8
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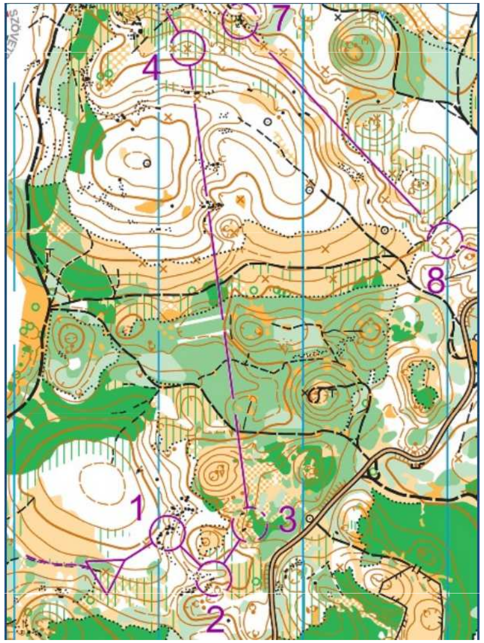
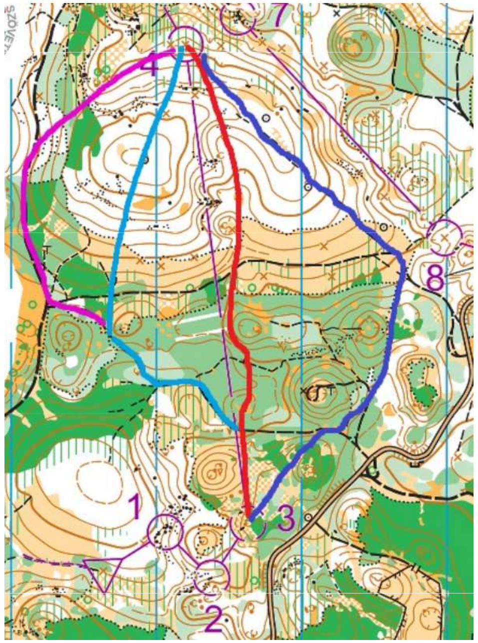
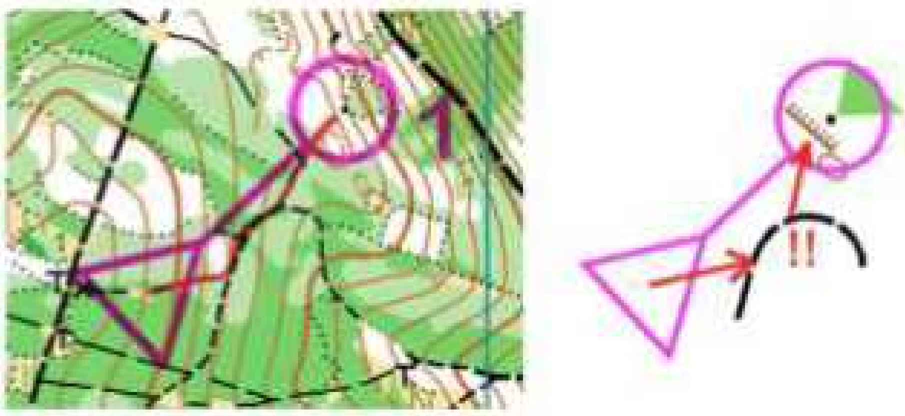
Orienteering process



Read the map



Route choice



Select proper skills, combine them and execute

TOVE ALEXANDERSSON
TRAINING IN GUARDAMAR, SPAIN
Tove A

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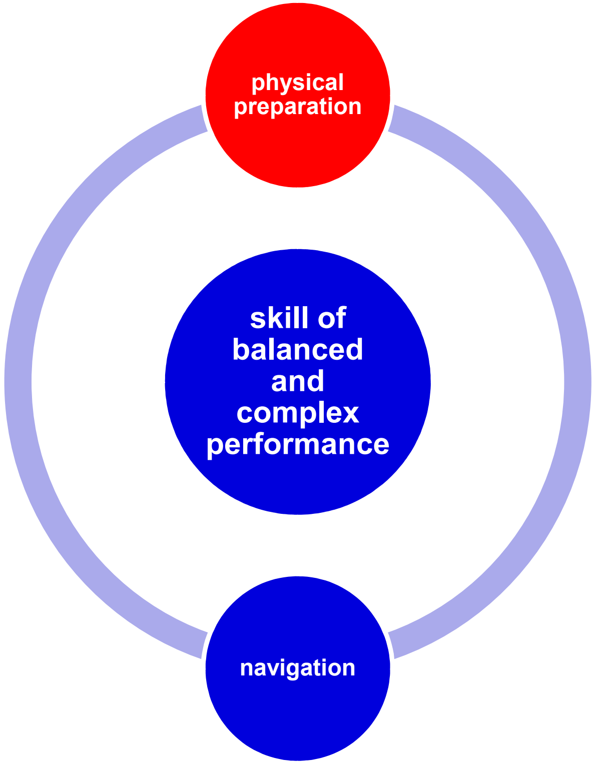
O-map practice in elite runners

- World class runners up to 30-50 % of running is with map
- Map training should be considered as aerobic training
- Club trainings and race ➔ often reason for high ratio of high intense training (risk of injury or overtraining)
- Needs for time and space without preasure – technique first then increasing running pace
- *Question: continuously or concentrated in training camps?*

Coffee break?

TRIMTEX
SCAN|POLE
TRIMTEX
BOOSTER

Physical preparation in O



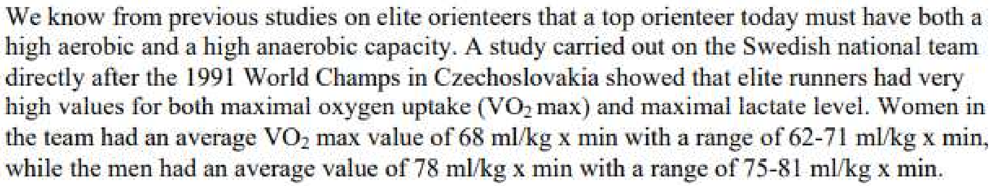
physical preparation

skill of balanced and complex performance

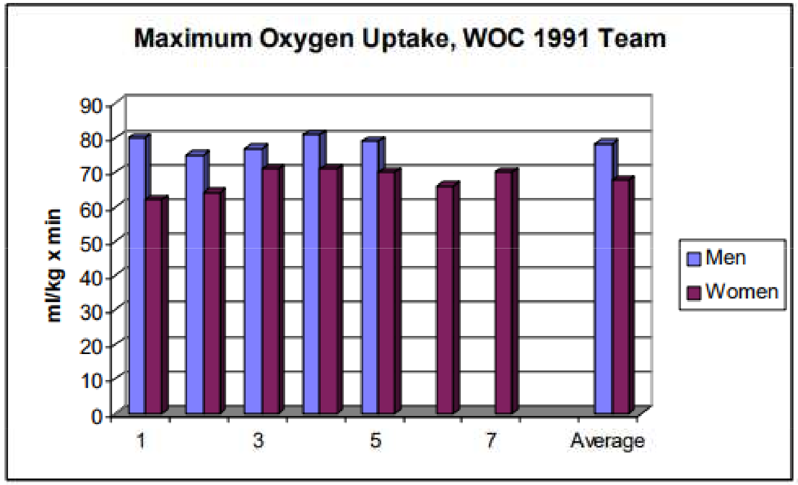
navigation

Physical determinants

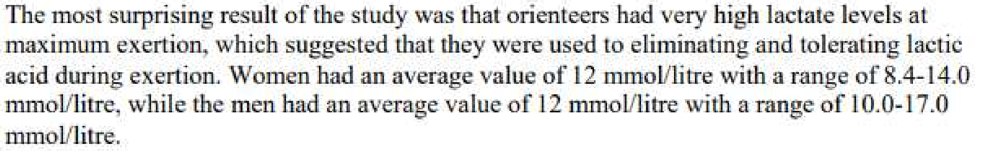
- High aerobic power and capacity
- High AT
- High AN capacity
- Duration: 8 minutes to 2 hours w/ variable physiological effort
- Strength: Forest X city – hips X ankles
- Stability: ankle, knee, hip, core (variable surfaces and slopes)



We know from previous studies on elite orienteers that a top orienteer today must have both a high aerobic and a high anaerobic capacity. A study carried out on the Swedish national team directly after the 1991 World Champs in Czechoslovakia showed that elite runners had very high values for both maximal oxygen uptake (VO_2 max) and maximal lactate level. Women in the team had an average VO_2 max value of 68 ml/kg x min with a range of 62-71 ml/kg x min, while the men had an average value of 78 ml/kg x min with a range of 75-81 ml/kg x min.



Maximum Oxygen Uptake, WOC 1991 Team



The most surprising result of the study was that orienteers had very high lactate levels at maximum exertion, which suggested that they were used to eliminating and tolerating lactic acid during exertion. Women had an average value of 12 mmol/litre with a range of 8.4-14.0 mmol/litre, while the men had an average value of 12 mmol/litre with a range of 10.0-17.0 mmol/litre.

https://www.britishorienteering.org.uk/document/ba28e3fbe62579412bce23d09f7ce892/international_squadtrainingbook4_thedemandsoforienteering.pdf

Orienteering versus XC running

Bird, S. R., Bailey, R., & Lewis, J. (1993). Heart rates during competitive orienteering. *British journal of sports medicine*, *27*(1), 53–57.

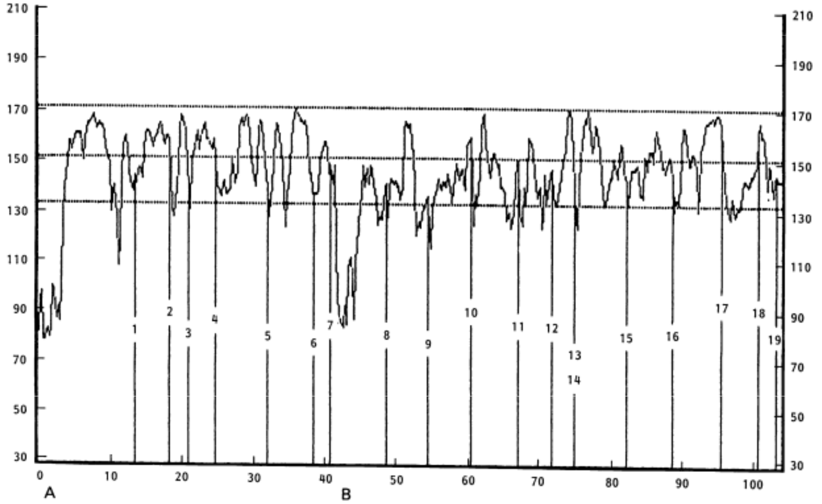


Figure 1. A typical heart rate profile for an event. Numbered vertical lines indicate the arrival at each control site (19 in total). 'A' indicates the point at which time was spent copying down the first half of the course at 'master maps' and 'B' indicates the drop in heart rate associated with copying down the second part of the course at 'second master maps'

Bird, Steve & George, M & Balmer, J & Davison, Richard. (2003). Heart rate responses of women aged 23-67 years during competitive orienteering. British journal of sports medicine. 37. 254-7.

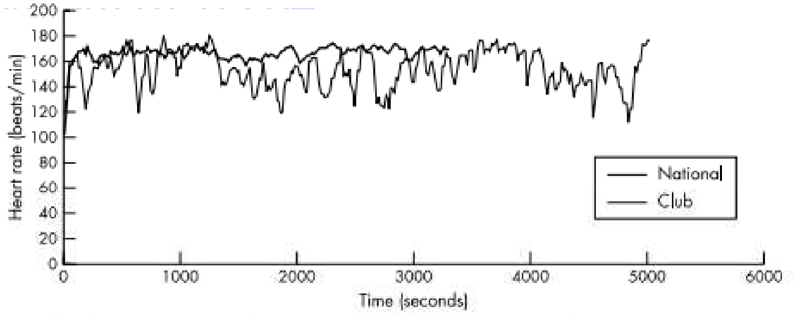
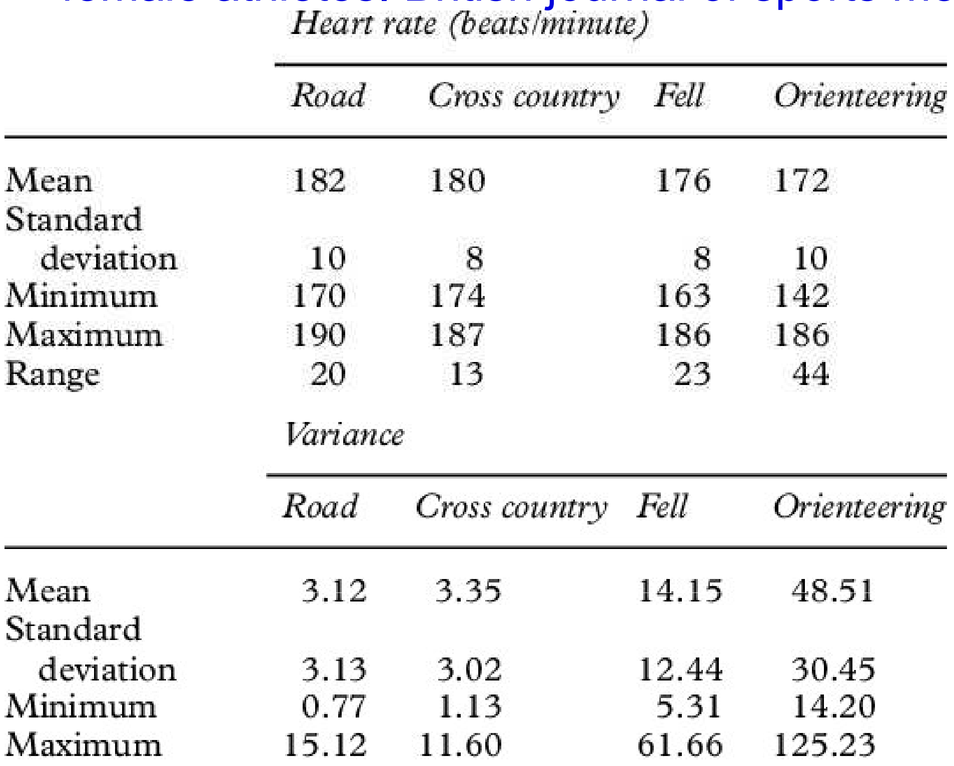


Figure 1 Heart rate profiles of a national standard (aged 41 years) and club standard (aged 37 years) orienteer.

Orienteering versus XC running

Creagh, U & Reilly, T & Nevill, Alan. (1998). Heart rate response to "off-road" running events in female athletes. British journal of sports medicine. 32. 34-8. 10.1136/bjsm.32.1.34.

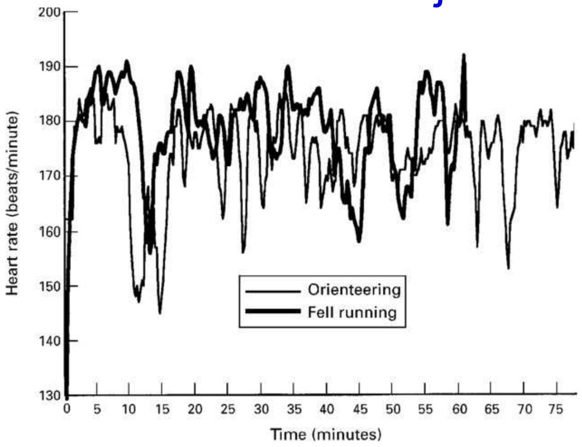


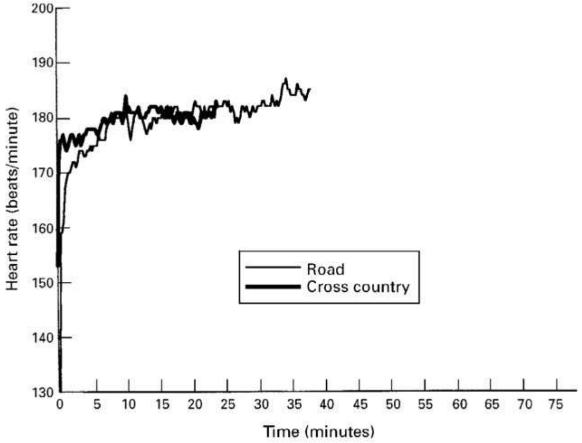
Heart rate (beats/minute)

	Road	*Cross country*	*Fell*	*Orienteering*
Mean	182	180	176	172
Standard deviation	10	8	8	10
Minimum	170	174	163	142
Maximum	190	187	186	186
Range	20	13	23	44

Variance

	Road	*Cross country*	*Fell*	*Orienteering*
Mean	3.12	3.35	14.15	48.51
Standard deviation	3.13	3.02	12.44	30.45
Minimum	0.77	1.13	5.31	14.20
Maximum	15.12	11.60	61.66	125.23





Endurance

Continuous methods

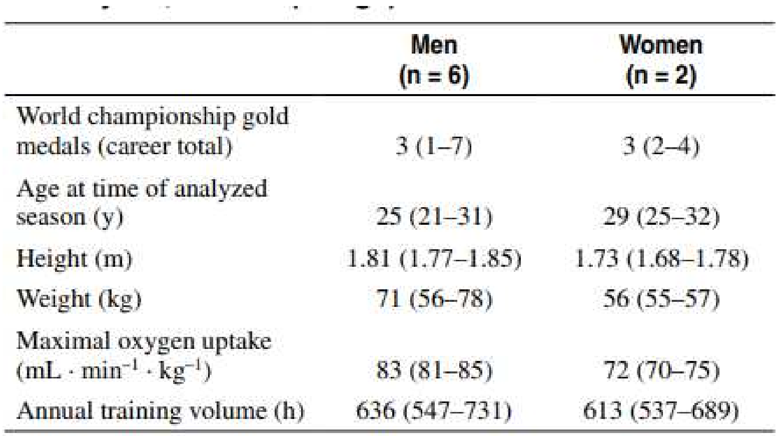
- LSD (typically up to 3 hours)
- Easy (active regeneration)
- Fartlek
- Alternatives: XC skiing, bike, DWR
- COMPETITIONS (up to 40 races/year, but up to 10 with A-priority)

Intermitent methods

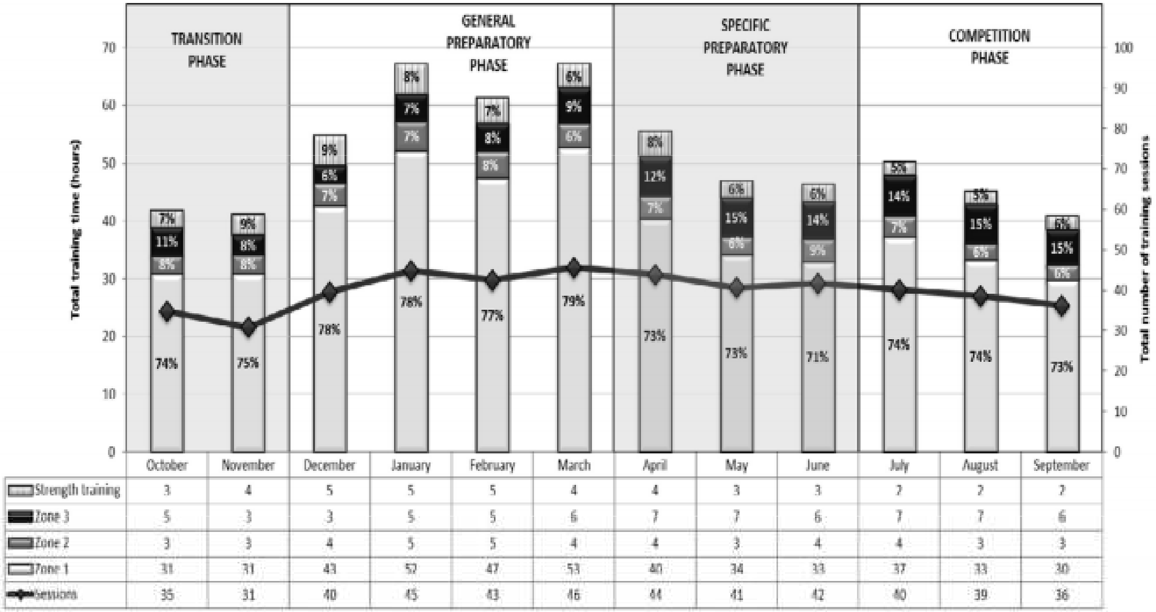
- Tempo runs
  - 2x20min
- Track intervals
  - 4x4min
  - 10x1km
  - 2x3x200m VS 2x20x200m
- Hills and flats
  - 2x5x10-20sec uphill
  - 3x7min steep uphill

Intensity & volume

Tønnessen, Espen & Svendsen, Ida & Rønnestad, Bent & Hisdal, Jonny & Haugen, Thomas & Seiler, Stephen. (2015). The Annual Training Periodization of 8 World Champions in Orienteering. International journal of sports physiology and performance. 10. 29-38. 10.1123/ijspp.2014-0005.



	Men (n = 6)	**Women (n = 2)**
World championship gold medals (career total)	3 (1–7)	3 (2–4)
Age at time of analyzed season (y)	25 (21–31)	29 (25–32)
Height (m)	1.81 (1.77–1.85)	1.73 (1.68–1.78)
Weight (kg)	71 (56–78)	56 (55–57)
Maximal oxygen uptake (mL · min^{-1} · kg^{-1})	83 (81–85)	72 (70–75)
Annual training volume (h)	636 (547–731)	613 (537–689)



	October	November	December	January	February	March	April	May	June	July	August	September
▤ Strength training	3	4	5	5	5	4	4	3	3	2	2	2
■ Zone 3	5	3	3	5	5	6	7	7	6	7	7	6
▨ Zone 2	3	3	4	5	5	4	4	3	4	4	3	3
□ Zone 1	31	31	43	52	47	53	40	34	33	37	33	30
◆ Sessions	35	31	40	45	43	46	44	41	42	40	39	36

Figure 1 — Training phases and monthly training time for strength training and endurance training in each of the 3 intensity zones (bars) and training frequency (line) in the year leading up to winning a world championship. Values are group means.

MUNI SPORT

Running specificity

- Orienteering has own specificity in running technique (depended on surface and strength capacity)
- Grass, sand, vegetation (tree branches, thorns, …), paved paths, stones, swamps, …
- Every step is unique
- Runners are limited approach to terrain/map
- VO_2max is better to develop in T&C manner, but AC in O manner

NOKIAN TYRES
WORLD ORIENTEERING
CHAMPIONSHIPS
TARTU • ESTONIA 2017
CZE
TRIMTEX
43
Long Distance - Rõuge
nokian TYRES

oto: WorldofO.com

Case study

- YoB 1991 (27yo), PhD student in Microbiology
- Background in karate, started in O in 13yo
- Member of Czech nat. Team since junior category
- Now #45(middle+long) / #51 (sprint) in World Ranking
- Best results:
    - 6th place, relay, WOC 2015
    - 22nd place, sprint, WOC2017
    - 18th place, long, WOC2017

- Cooperation with me started after repeated AT/calf injuries (strength deficit)
- On the other hand, there is no S&C coach in O-world. All the pieces makes a picture!
- Since 2018 coordinating all phys. prep.

Key principles for O-training (in elite adults)

This is our training philosophy, but there are so many road to Rome…

- You can‘t compete all year long.
- Sometimes you have to push harder (camps) and draw back (peaking, off-season).
- Only consistency leads to the top.
- Setting short-, mid- and long-term priorities (with respect to SMART rule).
  - Short: next traning block
  - Mid: year
  - Long: WOC 2021 in CZE
- Weak point identification.
- Polarized-intensity training.
- Top elite o-runner should do a lot of „boring“ stuff – theoretical preparation, S&C, analyzing GPS data, travelling, …
- Plan should be written by apencil, not a pen. (Injuries, sickeness, work/school, family, …)
- Collect (not over-collect) data & proper evalution.
- O is about experience, that‘s the reason why O-runners hit the top performance in late 20s
- Runners should run the highest recoverable volume (BUT quality-oriented!), future progression could be done with transformation unspecific cross-training to specific modality (running).
- Runners should run when they can. When they can‘t, do what they are able to do. On the other hand – you can‘t run exclusively

Mid-term priorities (ATP)

2016/2017 = 420h (only 278h running, A.T. injury)
plan 2017/2018: 470h + TOP10 EOC/WOC long; reality 450h (but 351h running) + 37th place

	NOV			DEC			JAN			FEB		
							1		*Nový Rok*			
							2					
	1						3					
	2						4			1		
	3			1			5			2		
So	4			2		O-Gala	6			3		
Ne	5			3			7			4		
	6			4			8			5		
	7			5			9			6		
	8			6			10			7		
	9			7			11			8		
	10			8			12			9		
So	11			9			13			10	POM	
Ne	12			10			14			11	POM	
	13			11			15			12	POM	
	14			12			16			13	POM	
	15			13			17			14		
	16			14			18			15		
	17			15			19			16		
So	18			16			20			17		
Ne	19			17			21			18		
	20			18			22			19		
	21			19			23			20		
	22		NAT. CAMP	20			24			21		
	23			21			25			22		
	24			22			26		NAT. CAMP	23		
So	25			23			27			24		
Ne	26			24		*Vánoce*	28			25		
	27			25			29			26		
	28			26			30			27		
	29			27			31			28		CAMP SUI
	30			28								
				29								
So				30								
Ne				31								
dní												
			4			0			3			1

	MAR			APR			MAY			JUN		
							1					
							2					
	1		CAMP SUI				3					
	2						4		EOC	1		měření laktát
So	3						5	PGP		2		CAMP CZE
Ne	4			1		*klubové kempy*	6	PGP		3		
	5			2		*Velikonoce*	7			4		
	6			3			8			5		
	7			4			9			6		
	8			5			10			7		
	9			6			11			8		
So	10			7			12			9	ASU	
Ne	11			8			13			10	ASU	
	12			9			14			11		
	13			10			15			12		
	14			11			16			13		
	15			12			17			14		
	16			13			18			15		
So	17		CAMP POR	14	NOB		19	Mspr		16	Venla	
Ne	18			15	SJC		20	VTA		17	Jukola	
	19			16			21			18		
	20			17			22			19		AM ČR Brno
	21			18			23			20		AM ČR Brno
	22			19			24			21		
	23			20		EOC selections	25			22		
So	24			21	B LCE		26	š+s		23	MKT	
Ne	25			22			27	š		24	MKT	
	26			23			28			25		sled.z.MS long
	27			24			29			26		
	28			25		*nominace ME*	30			27		
	29			26			31			28	*nominace MS/AMS/S*	
	30		*klubové kempy*	27						29		
So	31		*klubové kempy*	28	10m					30		
Ne				29	10m							
				30								
dní												
			13			3			11			8

	JUL			AUG			SEP			OCT		
										1		
										2		
				1						3		WC CZE
				2		WOC				4		
				3						5		
So				4			1		WC NOR	6		
Ne	1			5			2			7		
	2		PEAKING CAMP	6			3			8		
	3			7			4			9		
	4			8			5			10		
	5			9			6			11		
	6			10			7			12		
So	7			11			8	BOR		13	Mš	
Ne	8			12			9	BOR		14	Mdr	
	9			13			10			15		
	10			14			11			16		
	11			15			12			17		
	12	hory		16			13			18		
	13	hory		17			14			19		
So	14	hory		18			15	Mklas		20		
Ne	15	hory		19			16	Mklas		21		
	16	hory		20			17			22		
	17	hory		21			18			23		
	18			22			19			24		
	19			23			20			25		
	20			24			21		WC selections	26		
So	21	GPS		25			22			27		
Ne	22	GPS		26			23			28		
	23			27			24			29		
	24			28			25			30		
	25			29			26		*nominace SP*	31		
	26			30		WC NOR	27					
	27	ŠD		31			28	Mmix				
So	28	ŠD					29	TZLš				
Ne	29	ŠD					30	TZLš				
	30											
	31											
dní												
			17			14			5			5

Akce RD:

🟧	WC/EOC/WOC + selection races
🟩	camps
🟦	deload

General preparatory phase

Rest week between camps (over 11 hours/w)

19.2	AM: rest PM: hills with map
20.2	AM: swimming PM: gym
21.2	AM: rest PM: 5×9'
22.2	AM: DNS warm-up KTB halo 20 reps 10 kg KTB TGU 4x12,5 kg, half TGU 3x 15 kg barefoot goblet squat 5x6 24 kg (tempo 2120) KTB complex (10kg): 6x [1xclean(LRLR = change after set) + 3x front squat + 6 (3+3) lunges forward a 6 (3+3) reverse lunges + 3x front squat] calf raise 3x20 (lift toes with 2 plates, ecc phase 2 sec) 67766 scap pull-up, 67766 box push-up, 67766 TRX row 10x 8+8 one-hand swing 10 kg, start on 1:00 PM: farlek 60-70' in hills, second half more intense
23.2	AM: 25' jogging w/ 8x10'' hill/flat odpo: 50' jog, 5x flat + running drills (no club night-O training)
24.2	AM: WU+flats+drils+ABC, 4x1000m (start@4:00/km)/200m walk PM: swimming/yoga/rest
25.2	AM: RRR+ABC, middle-to-long preparation race in city (60min), CD PM: rest

	C5	9,9	7,1	0,0	0,8	1,9	0,0	0,0	0,0	1,6	3,3	0,0	0,0	0,8	0,3	0,0
19.2	Ranní jóga a DNS cviky	1,6	1,3		47					47	28					
20.2	Ranní jóga a DNS cviky	1,1	0,0													
21.2	TVO	1,3	1,3								30			45		
22.2	Posilka, nějak mi TGU s 15 kg dalo zabrat	2,7	1,5			67					25					
23.2	Ranní klus 33' a rovky, na ledu 8×10''	1,4	1,3								73				3	
24.2	4×1 km (3:57 - 3:53 - 3:46 - 3:43) MZCH 2', R, R, ABC, 3TR, V, p mám radost, docela to šlo. První bolela nejvíc, a pak jak kdybych si rozpomínala jak to dělat :) Ale má to i :(protože mne fakt bolel ten zadek	0,8	0,7								25				16	
25.2	BZL, 47:35. R,R,V. Snažila jsem se držet nasazení, Mapa na prvním místě, disciplína a šlo to. Já vím, jak na to, Kázeň a víra (Kázeň na tlačit na to dost, neuhýbat terénu a zvolenému postupu a víra, v sebe, že na to mám	1,1	1,1			47				47	18					

Next week in GPP

Traning camp w/ National team in similar terrain for EOC

	C5	T2		11,1	11,1	3,3	4,0	2,2	0,3	0,0	0,0	6,5	1,3	0,0	0,0	0,0	0,0	0,0
26.2		40 min volně se ZBM na ledu :) Super, ale já jsem na ledu srágora	**AM:** rest **PM:** easy w/ club	0,7	0,7	40												
27.2	TVO - bolela mne hlava, po večerním nečekanm setkání		swimming or rest	0,0	0,0													
28.2	Odlet do Milána	Seznamovák Cunardo - Fakt za tmy konec. Jde to, mapa je taková všelijaká	**AM:** travelling **PM:** intro to typical situation in terrain (AP1)	1,4	1,4		76					76	7					
1.3	Taverne koučův downihll. Do kopce mi všichni utíkají, ale z kopce mi to šlo. Lehce pocukrovaný terén, na běh pořád dobré. Uphill 30, Downhill 53	Middlové úseky ve sněhu. Primární cíl se nezabít splněn, trošku rozčarování z časů - nebo nasazení a chyb v potocích!! (7:40 - 12:50 - 21:17 - 18:48)	**AM:** loops (AP1) **PM:** middle intervals (AP2)	2,6	2,6	53	53	50				103						
2.3	Alternativa sněžnému longu - výběh na rozhled - 107 min		**AM:** long 2h (AP1) **PM:** regeneration/rest	1,8	1,8	107												
3.3	Štafetky 18:35 - 20:30 - 24:08 - 20', R, V hodně snšhu, kluzalo to, nechápeme se s mapou, a měla jsem moc velká očekávání	Downhill slide 70 min a narazila jsem si koleno	**AM:** repeated mass starts (AP3) **PM:** downhill (AP1)	3,0	3,0		70	82				152	28					
4.3	Sprint comano: 16:10, výkl 15, rozkl 11 rozcv 7, mega chyba na 7K. Fyzicky se cítím pomalá, jako kdyby to ve mně bylo, ale já k té skíňce s rychlostí neměla klí a páčidlem se do ní nejde dostat. Bolí mne to naražené koleno, zadek byl v klidu	Arogno, volně, sníh nad kotníky R a V 15', koleno bolí, zadek jen lehce, ale mám pocit, že z toho klouzání mne zase chytá SI a trochu bederka	**AM:** mix relay race (AP3) **PM:** picking downhill (AP1)	1,6	1,6		40		16			57	41					

MUNI
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Competion phase

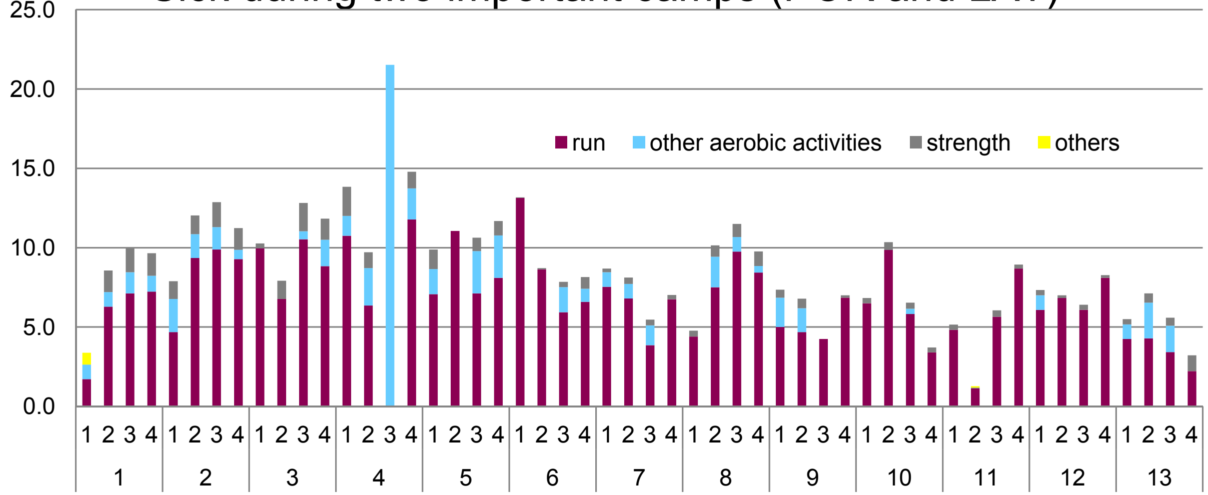
Reduction in volume, keeping the same density and intensity

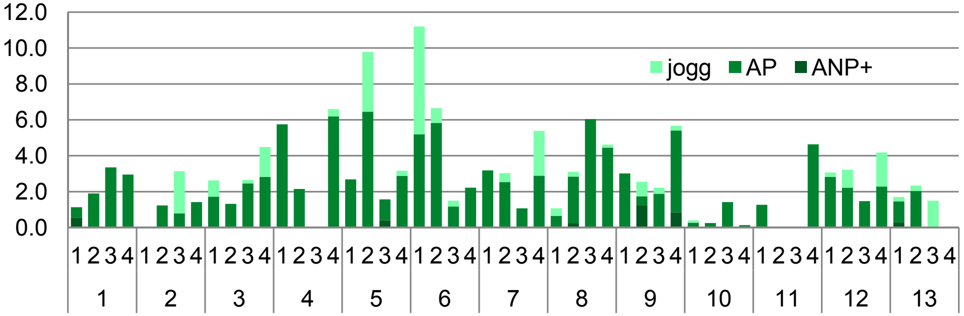
	C10	T2		10,4	9,9	0,0	0,0	0,0	0,3	0,0	0,0	0,8	5,8	1,4	0,8	0,6	1,1	0,0
16.7	R 17', R 7', 20m ABC (lift, skip, před zák, posk kl, poskoky stranou, vánočka, A skip, B skip, zpět protahovací ABC), 5× TR 12'', Odpichy 2× 6× 24 odpichů, zpět mzkl, Krátké kopečky 6×10'', 5× TR 12'', výkl na kampus 10'	R - 13', R 7', ABC 4', 2TR 50m, 2 km Morenda (6:57) nikdo neběžel se mnou, tak to byl takový solo výkon. Rozběhla jsem to na pocit, pak jsem se od 1000m začala snažit a takhle to dopadlo. Bylo vedro, takže jsem byla ráda, že jsem se moc dlouho nerozcvičovala, to bych už byla vyfluslá. pauza 6', klus na stezku 5', 1500 (6:24) - 1000 (4:25) - 750 (3:05)- 500 (2:05), V 11', P - 15'	**AM:** WU, flats, drills, 2×6×10'' bounce, 6×10'' hills, 5xflats, CD **PM:** Morenda meeting 2 km, + 1500-1000-750-500 s pauzou 90''	1,6	1,4								64				19	
17.7	TVO, vyřizování ve městě, v práci v klidu	Kampus -> údolí oddechu = Fartlek 45', rozkl, 13', rozcv 7', V 30'. To jsem se táhla, nějak jsem špatně odhadla kde skončím aten výklus byl dlouhý a do kopce. Navíc bylo docela teplo, jen těsně jsem nezmokla.	fartlek 45' +WU+CD	1,5	1,5								47		45			
18.7	Sprintové intervaly 5× 3' mzkl 2'. Je těžké vracet se do mapové rutiny po mzkl. Plynulost je absolutní priorita, vzpomeň si na Hubmana. Takže v dalších a všech trénincích to musí být první věc, kterou chceš dělat. Plynule, vědět kam, mapovat, mapovat, mapovat!. R 21', R 5', protahovací ABC 3', V 17'	Dráha Morenda, 4×2 km, (8:01 - 8:05 - 8:01-8:01), mzkl 200m, 1:50 - 2:05 rozkl 12', rozcv 5', ABC 8×20 m 5', 5×60 m TR, V 12', P 15'. Tyhle věci bolí, strašně. Bolely mne nohy už u první, fakt jsem se musela snažit a tepovka pod 120 před dalším výběhem nepadla. Kdyby mi to Honza neodtahal, tak to možná ani nedám v těhle časech. Ale je to tam, jsem spokojená. I když bych si přála chodit je po sedmi, že ano Adi.	**AM:** map intervals **PM:** 4×2km @4:00/km	2,2	2,1				15			15	76				33	
19.7		Volný výklus se Standou + 6 rovinek na 12'', 23 + 26' klus, 7' rozcv, večer flákací regebazén	easy + flats (6-10 reps)	0,8	0,8								49				1	
20.7	Kopečky. R 14', R 7', ABC (90° otočky po 4 opak) 17', Krátké kopečky stejné jako v pondělí, 2×6×10'', i sejít dolů, ios 5' klus, V 12'	Pyramidka, 3×100-200-400-200-100, i 200m jogg (1:40), ios 400m jogg (4:00). 18 - 34 - 83 - zapomněla :D 17''; 18 - 39 - 85 - 39 - 18; 20 - 37 - 79 - 36 - 18. R 12, R 9', ABC + 5 TR 10', V 9', protažko v posilce 10'	**AM:** short hills (same as MON) 2x5 /rest 5jog **PM**: 3x(100-200-400-200-100/200m jog)/400m jog	1,1	0,9								45				11	
21.7		Souvisle snaha o AP1, oběhnutí si cyklotrasy ZBM triatlonu s malým zakufrováním. R 12', R 5', V 10', 85', vedro bylo, bolelo to, ale zábava byla. #když nemůžeš přidej víc.	WU+CD+ cont. 70' AP1	1,8	1,8								22	85				
22.7	Model MS Ivančice, Qualifier 15:40, nedočetla jsem jediné složité místo. Bylo to běžečtější, měla jsem možná víc do toho tlačit? Ale priorita byla absolutní plynulost. Škoda, toho nedočtení, jinak by to bylo moc pěkně plynulé. R 10', R 5', ABC (lift, skip, před zák, posk kl, skoky stranou, vánočka, A skip, B skip) 7', 4× 40 m TR i mzch, V 9'	Model MS Ivančice, Final. 18:03, Přestávalo pršet, pak už mrholilo jen lehce, aspoň nebylo vedro a dobře se běželo. Trochu víc zavřených dveří, pak si to chce naměřit ty namyšlené postupy. R 16, R 5', ABC 5', 4 TR 3', V 10'	MODEL WOC Ivančice (Q+F)	1,4	1,3							33	45			33	1	

23.7	Odpichy 2×6×24 odp, i mzkl, ios chůze, R 8', R 7', ABC 1', V 10'. Trochu mne bolí achilovka i za krkem, dnes mi to přijde lepší.	Rovky, R 10', R 5', 10× 100m R, V 10'	**AM**: plyometrics **PM**: flats	0,9	0,8								44				2	
24.7	Rosice ranní 17:04, R 8', R 3', ABC+rovky 3', V 8'. Bylo ráno, bylo teplo. Snažila jsem se, ale nepřišlo mi to rychlé. Vůbec. Plynulost lepší.	Rosice odpolední 21:37, ještě navrch jsem zapomněla na kotrolu a jsem disk. rozkl 12', rozcv 5', ABC 5', 4 TR, V 16	**AM**: Maps **PM**: Maps (Rosice)	1,4	1,3				28			28	48				1	
25.7	Trošku si zajógovat	R13', R 5', ABC - 20m otáčky o 90° po čtvrtině, lift, skip, před, zák, posk kl, cval stranou, vánočka, A skip, B skip, 8×50m TR, io klus zpět, V 18	**AM**: rest/easy **PM**: flats + drils (day maximum 60 min)	0,8	0,4								21				1	
26.7	Ranní sprint v Bystrci 17:31, R 12', R 5', 4' ABC + 3TR, V 12',	6×200 m maximální úsilí, io 3' (no peklo, na začátku mi to přišlo dlouhé, dokonce jsme přešli zase na start 200, ale od třetí se smyčka začala utahovat, pak už jsem si ani nevydechla. Po 32'', pátá 35'', strašně foukalo do protivky. Je těžké se tam tak rychle seskládat, ještě by to šlo a přitom by to nešlo :D R 12', R 7', ABC 8 cviků po 20 m, 4', 5×50m TR, io klus zpět, Výkl 12', část po trávě bosky. Ale litaly vosy, tak jen dvě kolce. P 10' v posilce	**AM**: map intervals (Bystrc) **PM**: 5-6×200 m (3-4 min rest ==> EXTREME EFFORT)	1,2	1,1				17			17	46				4	
27.7	TVO	odjezd do Jevišovic	Rest	0,0	0,0													
28.7	přes oběd v prádelně jevišovického lesa, ala vytrvalost, Rozkl: 12, AP 41', V 8', rozcv 5'	TVO, úklid, bazén, cesta do Brna	**AM**: AP1 40+jogg=60', flat profile **PM**: flats	1,0	1,0								20	41				
29.7	Petrov spirntové okruhy, rozkl z Mendláku 12', rozcv na achilovky, R 5', ABC, 4', 4 rovky, A - 3:42, i 3', B - 4:29, i 4', C - 3:39, I 4:30, D - 3:23, i3:20, E - 3:13, V na Mendlák 12'	Tišnov sprint, 16:38. Už to chytám, snad. Byla jsem s tím docela spokojená, i když bylo horko, i když to netáhlo, ale mapově už to jde. R 12, R 6', V 10', nejraději bych se plazila.	MODEL WOC Brno (Q+F)	1,3	1,3				40			40	36					

Evaluation of season 2017/2018

- No injuries! Almost consistent training all year long.
- Fully implemented strength preparation to GPP.
- Better both-way communication (Strava/Garmin connect, IM) – extremly time consuming
- Stagnation on 3K test (very important for WOC 2020 – sprints discipline only)
- Selected just for one race at WOC (weakest discipline) – 37th place in F (much more better in Q) → successfully switched from focusing from long to sprint
- Sick during two important camps (POR and LAT)





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What about this season?

- She was very tired after final WC round → sick for 2 weeks → blood test (vit. D deficit) → sick again and again → mononucleosis → 1,5m break → almost no basis for for competing in spring → decided to skip first WC round for building volume/intesity and now fully focused on selection races for WOC 2019 in Norway (long & relay)
- Is she going to be at TOP10? We don‘t know, but we are on good way!

Thank you for you attantion!

Q&A

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